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ABSTRACT

This instructor guide and the corresponding student reference contain 10 lessons to enhance an Agricultural Science I course for grade 9. The lessons cover the following topics: introduction, psychology and handling, conformation and selection, genetics and reproduction, herd health, hoof care, nutrition, equipment and facilities, handling horses, and career opportunities. The instructor's guide contains the following: objectives, competencies, a teaching calendar, 23 references and resources, and a student competency profile, In the instructor's guide, each lesson includes an introduction, objective, study questions, references, teaching procedures, and an evaluation with answer key. Transparency masters, assignment sheets, and activity sheets are included as appropriate. The student reference consists of information sheets and illustrations for the lessons. (KC)

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10-4610-I
Instructor

Equine Science

In cooperation with Agricultural Education, Department of Practical Arts and Vocational-Technical Education, College of Education and College of Agriculture, Food and Natural Resources, University of Missouri-Columbia.
In cooperation with Agricultural Education Section, Division of Vocational and Adult Education, Department of Elementary and Secondary Education, Jefferson City, Missouri.

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Instructor Guide

EQUINE SCIENCE

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5. The student will understand what is involved in a herd health program and why it is important.

6. The student will be able to identify the various structures of the hoof, along with care of the hoof and associated health problems.

7. The student will understand parts of the horse's digestive tract and what the different nutritional requirements are for different horses.

8. The student will become familiar with various types of equipment and facilities, along with their proper care and use.

9. The student will become familiar with the proper methods of handling a horse, including how to lead, lunge, mount and dismount, and safely trailer a horse.

10. The student will learn that the equine industry has many career opportunities.

COMPETENCIES (Numbers in parentheses correspond with computerized VAMS numbers.)

1. Identify horse types, breeds, and uses (Y014)
2. Discuss behavior principles of the horse (Y015)
3. Identify ideal selection and conformation traits (Y016)
4. Identify basic genetic and reproductive characteristics in horses (Y017)
5. Develop a herd health program (Y011)
6. Discuss hoof structures and care (Y018)
7. Identify a ration to meet the nutritional needs of horses (Y012)
8. Identify proper tack, equipment, and facilities for horses (Y019)
9. Identify basic techniques of handling horses (Y020)
10. Examine career opportunities (Y021)

TEACHING CALENDAR

	Days
Lesson 1--Introduction	1
Lesson 2--Psychology and Handling	1-2
Lesson 3--Conformation and Selection	1-2
Lesson 4--Genetics and Reproduction	2
Lesson 5--Herd Health	2
Lesson 6--Hoof Care	1
Lesson 7--Nutrition	3
Lesson 8--Equipment and Facilities	2
Lesson 9--Handling Horses	1-2
Lesson 10--Career Opportunities	1
	15-18

REFERENCES AND MATERIALS

1. Student Reference

   Leffert, Kenneth L. *Equine Science (Student Reference).* University of Missouri-Columbia: Instructional Materials Laboratory, 1995.

2. Teacher References

   a) *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.

   b) *Curriculum Material for Agriscience 334: Equine Science.* College Station, TX: Instructional Materials Service, Texas A&M University, 1990.

   c) *Equine Management and Production.* Stillwater, OK: Curriculum and Instructional Materials Center, Oklahoma Department of Vocational and Technical Education, 1994.

   d) University of Missouri-Columbia Extension Division agricultural publication

      1) G2780: Horse Registries and Associations
      2) G2790: Horse Breeding Arithmetic: 2 + 2 = 1
      3) G2791: Genetics of Coat Color of Horses
      4) G2807: Feeding Horses
      5) G2840: Unsoundness and Blemishes of Horses: Feet and Legs
      6) G2842: Determining Age of Horses by Their Teeth
      7) G2843: Leg Set: Its Effect on Action and Soundness of Horses
      8) G2844: Haltering and Tying Horses
      9) G2845: Choosing, Assembling and Using Bridles
      10) G2854: Controlling Internal Parasites of Horses
      11) G2880: Horse Safety: Catching, Leading and Grooming

   e) *OSU Extension Facts No. 9115.* Stillwater, OK. Division of Agricultural Science and Natural Resources, Oklahoma State University, 1990.

   f) Ensminger, M. Eugene. *Horses and Horsemanship.* 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

   g) Fraser, A. *The Behavior of the Horse.* Melksham, U.K.: Redwood Press Ltd., 1992.

   h) Fraser, Clarence M., ed. *The Merck Veterinary Manual: A Handbook of Diagnosis, Therapy, and Disease Prevention and Control for the Veterinarian.* 7th ed. Rahway, NJ: Merck & Co., Inc., 1991.

   i) Harper, F. *Top Form Book of Horse Care.* New York: Popular Library, 1971.

   j) Hawcroft, Tim. *The Complete Book of Horse Care.* New York: Howell Book House, Inc., 1994.

   k) Lee, J. S., and D. L. Turner. *Introduction to World AgriScience and Technology (Activity Manual).* Danville, IL: Interstate Publishers, Inc., 1994.

   l) Thompson, Greg. *Agricultural Science Lab Activities.* University of Missouri-Columbia: Instructional Materials Laboratory, 1994.

FOREWORD

Development of *Equine Science* is the result of MVATA Teaching Aids Committee suggestions. The unit was developed to enhance the Agricultural Science I course for grade 9.

This instructor guide and the corresponding student reference contain 10 lessons: Introduction, Psychology and Handling, Conformation and Selection, Genetics and Reproduction, Herd Health, Hoof Care, Nutrition, Equipment and Facilities, Handling Horses, and Career Opportunities. Transparency masters, assignment sheets, and activity sheets have been included where appropriate. Additional student reference copies can be purchased separately.

During the summer of 1981, the Missouri State Board of Education formally adopted the concept of "Instructional Management Systems" (IMS) as a priority for the 1981-82 school year. The Missouri Commissioner of Education described the IMS concept as a practical way of "organizing for excellence" in education. To meet the demand for greater productivity and accountability, the director of Vocational Education applied the elements of IMS to form the Vocational Instructional Management System (VIMS). The VIMS process provides a framework to use in planning and organizing to assure excellence in Missouri's vocational education system by focusing greater attention on the management of teaching and learning.

This guide incorporates the needed component parts to aid agriculture teachers in the implementation of VIMS. For ease of use, performance objectives and competencies have been included at the beginning of the guide, as well as incorporated within each lesson. A competency profile has been provided in the front of the guide for convenient record keeping.

Jim Bellis, Supervisor
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OBJECTIVES

1. The student will explain origins of the horse; how it has influenced American society; how it was reintroduced to the U.S.; and some of the types, sizes, colors, and breeds of horses.

2. The student will identify different equine psychological traits, along with the proper handling and training techniques of the horse.

3. The student will be able to identify the ideal selection and conformation traits of a horse, along with what to look for when purchasing a horse.

4. The student will understand the basic genetic characteristics and reproductive organs of mares and stallions.

3. Audiovisuals (available for loan to Missouri educators from the Missouri Vocational Resource Center, 8 London Hall, Columbia, MO 65211. 800/392-7217 or FAX 314/882=9935.)

   a) "1992 Houston Livestock Show and Rodeo—Junior Horse Judging Contest." Texas A & M University, 1992. (61 frames, AG SL 67)

   b) "Horse Judging Kit." Visual Education Productions, 1987. (30 frames, AG SL 72)

   c) *Foaling*. Creative Educational Video, 1995. (16 minutes, AG video 216)

   d) *Fundamental Horse Hoof Care*. Creative Educational Video, 1992. (38 minutes, AG video 215)

   e) *Equine Nutrition: The Art, Science and Common Sense of Feeding Horses*. TKO Equine Video, 1987. (65 minutes, AG video 191)

   f) *Basic Horse Care*. Farnam Companies, Inc., 1987. (80 minutes, AG video 182)

   g) *Unbridled Opportunities*. American Horse Council, 1990. (24 minutes, AG video 214)

4. Computer Resources

   a) Extension Publications Library on Request (XPLOR) is an infobase on CD-ROM. It represents nearly 1,400 existing University of Missouri Extension publications. In the nearly 900 available full-text publications, there are more than 450 color graphics and photographs. Users will hear state horticulturalist Ray Rothenberger elaborate on more than 125 color photographs included in 25 publications. More than 400 additional publications are abstracted, and more than 100 additional titles are listed.

      Also included on this disc are the University Extension Directory for the University of Missouri System and the MU Center for Independent Study Course Catalog.

      Minimum computer requirements are: IBM-compatible machine with 80386 or better processor, ISO 9660 compatible CD-ROM drive, Microsoft Windows 3.1, 4 megabytes of RAM, and at least 4 MB free space on the hard drive.

      For the special academic price, call 1/800-292-0969 or write to Extension Publications, 2800 Maguire, University of Missouri, Columbia, MO 65211. E-mail can be sent to xplor@ext.missouri.edu.

   b) The Agricultural Electronic Bulletin Board Service contains a wealth of information. It is available via modem call at 314/882-8289 (573/882-8289 after July 1996), 9600 baud, protocol N-8-1 or E-7-1.

5. Other Resources

   Nasco, 901 Janesville Ave., Fort Atkinson, WI 53538-0901 (800/558-9595 or FAX 414/563-8296)

EQUINE SCIENCE
Competency Profile

Directions: Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:
3 **Mastered** - can work independently with no supervision
2 **Requires Supervision** - can perform job completely with limited supervision
1 **Not Mastered** - requires instruction and close supervision
N **No Exposure** - no experience or knowledge in this area

3	2	1	N	**Competencies**
				1. Identify horse types, breeds, and uses (Y014)
				2. Discuss behavior principles of the horse (Y015)
				3. Identify ideal selection and conformation traits (Y016)
				4. Identify basic genetic and reproductive characteristics in horses (Y017)
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				8. Identify proper tack, equipment, and facilities for horses (Y019)
				9. Identify basic techniques of handling horses (Y020)
				10. Examine career opportunities (Y021)
				______________________________

										STUDENTS: **Equine Science** Class/Section: ________________
										Competencies
										1. Identify horse types, breeds, and uses (Y014)
										2. Discuss behavior principles of the horse (Y015)
										3. Identify ideal selection and conformation traits (Y016)
										4. Identify basic genetic and reproductive characteristics in horses (Y017)
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										10. Examine career opportunities (Y021)

UNIT - EQUINE SCIENCE

Lesson 1: Introduction

Objective: The student will explain origins of the horse; how it has influenced American society; how it was reintroduced to the U.S.; and some of the types, sizes, colors, and breeds of horses.

Study Questions

1. **What has been the influence of the horse throughout history?**
2. **How did the horse return to America?**
3. **How has the role of horses changed from that of early America?**
4. **What are some of the different horse types, sizes, colors, and breeds?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publication
   a) G2780: Horse Registries and Associations

UNIT - EQUINE SCIENCE

Lesson 1: Introduction

TEACHING PROCEDURES

A. Introduction

The horse's role has been everything from a source of food to a source of power. In our society, the horse has had a major influence and has played a major role in the development of the U.S. This unit will address these various roles and discuss how the roles of yesterday compare to the roles of today.

B. Motivation

Show various pictures or slides showing horses involved in different activities. After students have had a few minutes to look over the pictures or slides, ask them to give further examples of equine activities.

C. Assignment

D. Supervised study

E. Discussion

1. It is thought that the Chinese were the first to keep horses in herds for uses other than food. Horses have been many things to people--a source of food, a weapon of war in the conquering of enemies, transportation, a companion, etc. Whatever the use, there is no doubt that the horse has helped shape the course of human history.

   What has been the influence of the horse throughout history?

   a) Food source
   b) Transportation
   c) Power source
   d) Companion

2. Almost since the beginning of time, horses have populated most of the world. However, in North America, they had vanished until they were reintroduced in the late 1400s by the Spanish Conquistadors.

   How did the horse return to America?

   a) Spanish Conquistadors
   b) Cortez
   c) de Soto
   d) Missionaries

3. When America was young and still unexplored, the horse was essential in providing transportation, power to pull plows, and companionship for the lonely cowhand on the trail. Almost everyone owned at least one horse. Today, the equine population is much less.

How has the role of horses changed from that of early America?

a) In early America
b) In America today
c) Population rise until early 1920s and decrease until early 1960s

4. Horses come in a variety of types, colors, and sizes. Choosing a type and breed of horse depends on the owner's needs and how much money the individual wants to spend.

What are some of the different horse types, sizes, colors, and breeds?

a) Classifying horses by size, build, weight, and type (light, draft, or ponies)
   1) Ponies: Less than 14 hands and 500-900 pounds
   2) Light: 14-17 hands high and 900-1,400 pounds
   3) Draft: 14-17+ hands and 1,400+ pounds
b) Color (black, brown, bay, and chestnut as common coat colors)
c) Breeds and breed registries

F. Other activities

1. Visit some local horse farms that have different breeds of horses. Have students look for the differences between breeds. Have them note the coloring of certain breeds and if there are characteristic colorings or other features that are unique to that breed. Explore the predictability of offspring coloring in horses as compared to other stock.

2. Go to a horse show. Have students look for as many unique characteristics as they can find.

3. View videos from the various breed associations.

4. Students can research information on a particular breed. Breed association addresses are available by: 1) doing a computerized search, 2) using the UMC Extension Guide G2780, or 3) contacting the American Horse Council, 1700 K Street, NW, Suite 300, Washington, DC 20006 (202/296-4031).

5. Display the poster, "Guide to Horses" (available for loan from MVRC or for purchase from Nasco).

6. Give a breed and color identification exam based upon breeds covered in class.

G. Conclusion

There is no doubt that horses have had a very large impact on humanity. People have been fortunate to have domesticated an animal that is much more powerful than themselves. Today, the horse's popularity is on the increase with such sports as dressage, endurance events, and hunter jumping. With these events receiving a great deal of notoriety in the Olympics, the number of horse owners will continue to increase.

H. Competency

Identify horse types, breeds, and uses.

I. Answers to Evaluation

1. c
2. a
3. c
4. d
5. b
6. d
7. b
8. a
9. c

UNIT - EQUINE SCIENCE

Name ____________________

Lesson 1: Introduction

Date ____________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. How was the horse was first used?

   a. Weapon
   b. Pet
   c. Food
   d. Entertainment

2. Who first kept herds of horses for uses other than food?

   a. Chinese
   b. Scythians
   c. Greeks
   d. Italians

3. When was the horse reintroduced to America?

   a. 1600s
   b. 1500s
   c. 1400s
   d. 1300s

4. Who did **not** reintroduce horses to the United States?

   a. Columbus
   b. Conquistadors
   c. Missionaries
   d. Germans

5. The horse population increased in the U.S. until when?

   a. 1910s
   b. 1920s
   c. 1930s
   d. 1940s

6. In the U.S., when did the decrease in horse numbers and popularity stop?

   a. 1930s
   b. 1940s
   c. 1950s
   d. 1960s

7. How are horses classified?

   a. Size and shape
   b. Size, build, and weight
   c. Build and shape
   d. Color only

8. How large are light horses?

   a. 14-17 hands and 900-1,400 pounds
   b. Less than 14 hands and around 1,000 pounds
   c. 14-17 hands and around 1,000 pounds
   d. 14-17 hands and 1,400+ pounds

9. How large are draft horses?

   a. 14-17 hands and 1,000 pounds
   b. 12-14+ hands and 1,000 pounds
   c. 14-17+ hands and 1,400 pounds or more
   d. 10-12 hands and 1,000 pounds

UNIT - EQUINE SCIENCE

Lesson 2: Psychology and Handling

Objective: The student will identify different equine psychological traits, along with the proper handling and training techniques of the horse.

Study Questions

1. **How do horses react to people?**
2. **What are the signs of danger people should recognize?**
3. **What are horse manners?**
4. **How do equine senses compare to those of other species?**
5. **How should a foal be handled?**
6. **What are some basic training methods?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.

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UNIT - EQUINE SCIENCE

Lesson 2: Psychology and Handling

TEACHING PROCEDURES

A. Review

Review types and breeds discussed in Lesson 1.

B. Motivation

Ask students if they have ever had or seen a horse rear up. Ask if they have seen any other aggressive or unusual behavior in horses. What do they think caused this behavior?

C. Assignment

D. Supervised study

E. Discussion

1. Animals--horses, in particular--seem to sense how a person is feeling. If a person has aggressive feelings, the horse might react in the same manner. If the person is very nervous or timid, the horse might be jumpy and hard to handle. This makes it important for the individual to be self-confident but have respect for the horse's power.

How do horses react to people?

a) Aggressively
b) Loyally
c) Stubbornly

2. Safety is very important to remember when handling a horse. The handler must be aware of the signals the horse is sending. Never become overconfident and let your guard down; that is an easy way to get you and/or the horse hurt.

What are the signs of danger people should recognize?

a) Ear positions (forward: interest, backward: anger)
b) Eye positions (closed eyes with ears back: sleep)
c) Tail movement (annoyance)
d) Pawing the ground (dislike of something or boredom)

3. Horses have their own mannerisms and quirks. Some seem easier to work with than others. Some mannerisms are instinctive, while others are learned. It is important to understand the difference between the two.

What are horse manners?

a) Good manners
b) Bad manners (vices)
    1) Barn sour--doesn't want to leave the barn or wants to get back to it
    2) Biting

3) Bolting feed--can be discouraged by spreading the food out or placing a large, baseball-sized rock in the feed
4) Cribbing--when a horse hooks its upper teeth on a solid object, extends its neck, and sucks in air
5) Pawing--boredom
6) Shying
7) Weaving, stall walking, and wood chewing

4. The horse's vision creates blind spots directly in front of the nose and behind the horse. It is these blind spots that make it dangerous to walk up on horses and surprise them. When approaching a horse, always approach from the side or at an angle so it can see you coming. It is a good idea to talk to horses so they also hear you coming.

How do equine senses compare to those of other species?

a) Monocular vision
b) Blind spots
c) Night vision
d) Excellent hearing

5. The new foal can be fun and rewarding to handle. It is important to start working with foals as soon as possible. They will be easier to handle after they learn to trust you.

How should a foal be handled?

a) Sacking at birth
b) Haltering at 1-2 weeks
c) Grooming

6. There are probably more ideas about how to train a horse than any other topic dealing with horses. Training methods vary from trainer to trainer, and each has his/her own particular style of training. However, there are some basics involved in training a horse.

What are some basic training methods?

a) Patience--most important characteristic
b) Repetition
c) Positive reinforcement
d) Discipline--always prompt and never administered out of anger
e) Discipline, reward, and timing

F. Other activities

1. Take a field trip to a local equine training facility and observe what methods of training they use.

2. If possible, observe the birth of a foal. Have students take note of how the foal is handled.

G. Conclusion

To be able to successfully and safely handle a horse, the handler must have some understanding of the psychology of the horse. Working and training should start soon after birth. It is important that the foal gets to know and trust its handler(s) as soon as possible.

H. Competency

Describe behavior principles of the horse.

I. Answers to Evaluation

1. c
2. d
3. b
4. c
5. b
6. b
7. b
8. a
9. d
10. c
11. a
12. c
13. a
14. b

UNIT - EQUINE SCIENCE Name ______________________________

Lesson 2: Psychology and Handling Date ______________________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. How do horses react to people?

    a. The same, no matter what
    b. In a positive manner
    c. Differently, depending on the horse
    d. In a negative manner

2. What is indicated when a horse's ears are perked forward?

    a. It is about to kick.
    b. It is about to go to sleep.
    c. It is angry at something.
    d. It is interested in something.

3. What is indicated when a horse's ears are backward and eyes are relaxed?

    a. It is about to kick.
    b. It is about to go to sleep.
    c. It is angry at something.
    d. It is interested in something.

4. What is meant by barn souring?

    a. The horse makes the barn smell sour.
    b. The barn's condition makes the horse smell sour.
    c. The horse refuses to leave the safety of the barn.
    d. The horse refuses to enter the barn.

5. How can a horse be stopped from bolting its feed?

    a. Putting pea-sized rocks in with the feed
    b. Putting baseball-sized rocks with the feed
    c. Lumping the feed up
    d. Withholding the feed

6. What kind of vision does a horse have?

    a. 360 degree
    b. Monocular
    c. Binocular
    d. Both binocular and monocular

7. Where are a horse's blind spots?

   a. On its side and to the rear
   b. Directly in front of its nose and to the rear
   c. On either side of its head
   d. On either side of its body

8. When should a foal be worked with?

   a. As soon as possible
   b. As soon as it is weaned
   c. At six months of age
   d. At 12 months of age

9. When should a foal be halter broken?

   a. At one year of age
   b. At six months of age
   c. At two months of age
   d. At two weeks of age

10. Which describes a vice in horses that involves sucking air and arching its neck?

    a. Heaves
    b. Air sucking
    c. Cribbing
    d. Cradling

11. What may be indicated when a horse continually paws the ground?

    a. Boredom
    b. Sore feet
    c. Insect annoyance
    d. Angry mood

12. What is usually meant when a horse swishes its tail?

    a. Too hot
    b. Too cold
    c. Annoyance
    d. Good mood

13. What is the most important quality for an effective trainer to have?

    a. Patience
    b. Loud voice
    c. Plenty of energy
    d. A lot of help

14. How should discipline be administered?

    a. Out of anger
    b. Promptly, but never out of anger
    c. At the end of the training session
    d. By someone else

UNIT - EQUINE SCIENCE

Lesson 3: Conformation and Selection

Objective: The student will be able to identify the ideal selection and conformation traits of a horse, along with what to look for when purchasing a horse.

Study Questions

1. **What are characteristics to look for when selecting a horse?**
2. **What influence should a horse's temperament have on selection?**
3. **How are balance and soundness important?**
4. **What are performance records and pedigrees used for?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
   - a) G2840: Unsoundness and Blemishes of Horses: Feet and Legs
   - b) G2842: Determining Age of Horses by Their Teeth
   - c) G2843: Leg Set: Its Effect on Action and Soundness of Horses

UNIT - EQUINE SCIENCE

Lesson 3: Conformation and Selection

TEACHING PROCEDURES

A. Review

Review Lessons 1 and 2.

B. Motivation

Begin by asking students if they have ever heard of people who have been taken advantage of by disreputable car salespeople because they didn't know anything about cars. Then ask whether they think it could happen when buying a horse.

C. Assignment

D. Supervised study

E. Discussion

1. Selecting a horse is kind of like buying a car; everyone wants four good tires, no flaws in the body, two bright headlights, good air intake, a sound motor, and a solid exhaust system. Of course, the emphasis will vary, depending on the owner's needs and skill level.

   What are characteristics to look for when selecting a horse?

   a) General body condition--healthy and of normal weight
   b) Gender considerations--stallions only for experienced riders
   c) Leg structure--front hoofs aligned in a straight line with the shoulder
   d) Muscling appropriate for the breed
   e) Tooth structure--indicates age
      1) Permanent teeth come in by age 4 ½ years.
      2) Horses have one set of temporary and one set of permanent teeth.
   f) Eye size and placement--large, wide-set eyes

2. When selecting a horse, one of the first things to take into consideration is temperament. If a horse is temperamental and unpredictable or even aggressive, it is better to keep looking--even if it has everything else you are looking for. A good-looking horse that is uncontrollable will only cause injuries.

   What influence should a horse's temperament have on selection?

   a) Small, narrowly set eyes are associated with poor eyesight and temperament problems.
   b) A good-looking horse with a bad temperament is a poor mix.

3. While it is important for the horse to be as sound as possible, no horse is perfect. Look for a well-balanced horse, one with few imperfections and good proportions. Making sure a horse is sound (healthy) and free from defects is very important. If the horse is not sound, there can be greater problems in the future that can create large medical bills or problems that can't be corrected.

How are balance and soundness important?

a) Balance (well developed and all parts blending together)
b) Two categories of structure
    1) Blemishes
    2) Unsoundness/defects
c) Minor travel or gait defects correctable by shoeing
d) Causes of unsoundness: an inherited trait or from some outside influence such as stress, strain, injury, or nutritional deficiency
e) Hidden problems caused by disreputable dealers

4. Performance records tell how the horse's ancestors performed and can help predict how well the animal will perform. A pedigree describes the horse's ancestry. Performance records tell how well past generations performed and can help predict how well an individual might do in the future. The Thoroughbred breed registry was the first to use performance records.

What are pedigrees and performance records used for?

a) Recording genetic characteristics
b) Breeding for excellence
c) Show ring winnings
d) Using with performance records
e) Recording ancestors and their performance

F. Other activities

1. Visit a breed registry or invite a representative to visit the class. Discuss the importance of registering a horse and the procedure for registering a horse.

2. Show examples of conformation by using the slides, "1992 Houston Livestock Show and Rodeo—Junior Horse Judging Contest" (61 frames, AG SL 67), or "Horse Judging Kit" (30 frames, AG SL 72), available from the Missouri Vocational Resource Center.

G. Conclusion

It is important to be able to distinguish between desirable and undesirable characteristics when choosing a horse, especially if the animal is for breeding purposes. Pedigrees and performance records can be valuable tools to use when selecting a horse.

H. Competency

Identify ideal selection and conformation traits.

I. Answers to Evaluation

1. c
2. d
3. c
4. b
5. d
6. b
7. c
8. a
9. a
10. d
11. b
12. a
13. b

UNIT - EQUINE SCIENCE Name ______________________________

Lesson 3: Conformation and Selection Date ______________________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. Which is true when considering a horse's gender?

   a. Never choose a stallion.
   b. Only beginners such choose stallions.
   c. Only experienced riders should choose stallions.
   d. None of the above

2. How should a horse's front legs look?

   a. Wider at the hoof
   b. Slightly wider at the hoof
   c. Slightly narrower at the hoof
   d. In a straight line with the shoulder

3. Which describes ideal eyes of a horse?

   a. Small and narrow set
   b. Large and narrow set
   c. Large and wide set
   d. Small and wide set

4. What reveals a horse's age?

   a. Its eyes
   b. Its teeth
   c. Its hair length
   d. Hooves

5. How long does it take for a horse's permanent teeth to come in?

   a. One year
   b. Two and one-half years
   c. Three years
   d. Four and one-half years

6. How many teeth does a horse have?

   a. Only one set
   b. One set of temporary and one set of permanent
   c. Two sets of temporary and one set of permanent
   d. 50

7. What is typical of a horse with small, narrow-set eyes?

   a. Good temperament
   b. Better eyesight
   c. Poor eyesight
   d. Keener senses

8. Which is true of a horse with a poor temperament?

   a. May cause injury
   b. Makes no difference
   c. Is just spirited
   d. None of the above

9. Structure can be broken into which categories?

   a. Blemishes and unsoundness
   b. Blemishes and flaws
   c. Flaws and unsoundness
   d. Flaws and spots

10. Which can cause an unsoundness?

    a. An inherited trait
    b. From outside stress and strain
    c. From nutritional deficiency
    d. Any of the above

11. What do performance records tell?

    a. How well the rider has done
    b. How well a horse has performed
    c. How well the rider will do
    d. None of the above

12. Which was the first breed registry to use performance records?

    a. Thoroughbred
    b. Quarterhorse
    c. Arabian
    d. Standardbred

13. What is a pedigree?

    a. Another name for hoof care
    b. Record of a horse's ancestry
    c. Another name for grooming
    d. All of the above

UNIT - EQUINE SCIENCE

Lesson 4: Genetics and Reproduction

Objective: The student will understand the basic genetic characteristics and reproductive organs of mares and stallions.

Study Questions

1. **What are the basic genetic characteristics?**
2. **What are the reproductive organs of the mare?**
3. **What are the reproductive organs of the stallion?**
4. **What are the methods of reproduction?**
5. **What takes place during parturition?**
6. **What is dystocia and how can it be handled?**
7. **Why is it important to check the afterbirth?**
8. **What is colostrum and why is it important?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
    a) G2790: Horse Breeding Arithmetic: 2 + 2 = 1
    b) G2791: Genetics of Coat Color of Horses
3. Assignment Sheet
    a) AS 4.1: Reproductive Part Identification

UNIT - EQUINE SCIENCE

Lesson 4: Genetics and Reproduction

TEACHING PROCEDURES

A. Review

Review pedigrees and performance records in Lesson 3.

B. Motivation

Ask students to feel their own ear lobes and determine if lobes are attached to their heads or are loose. Next, ask students to consider their eye color, hair color, and skin tone. Ask them what causes these differences.

C. Assignment

D. Supervised study

E. Discussion

1. Genes and how they mix determine an animal's characteristics. Groups of genes linked together make up chromosomes. In horses, there are 32 chromosome pairs, or 64 chromosomes in all.

   What are the basic genetic characteristics?

   a) Physical traits, such as color, muscling, stamina, speed, etc.
   b) Desirable traits
   c) Undesirable combinations, such as lethal genes (albinism)
   d) Chromosome pairs (32) and compatibility

2. Have students complete the first part of AS 4.1.

   What are the reproductive organs of the mare?

   a) Ovaries produce ova (eggs).
   b) Fallopian tubes connect ovaries to the uterus.
   c) Uterine horns are between fallopian tubes and the uterus.
   d) The uterus is where the embryo attaches and grows.
   e) The cervix muscle keeps out foreign material.
   f) The vagina receives semen from the stallion and is the birth canal.

3. Have students complete the rest of AS 4.1.

   What are the reproductive organs of the stallion?

   a) Penis
   b) Urethra
   c) Cowper's gland, which produces fluids
   d) Prostate gland, which produces fluids
   e) Seminal vesicles, which produce fluids
   f) Vas deferens

g) Epididymis
h) Testicles, which produce sperm
i) Scrotum

4. Ask students for reasons that hand breeding is the most practiced method with horses. Answers should include more accurate conception records, which greatly help in predicting the foaling date, and less chance of injury.

What are the methods of reproduction?

a) Natural (pasture) breeding: hard to predict foaling dates and higher chance of injury to mare and stallion
b) Hand breeding: most practiced method
c) Artificial insemination (AI): not widely used with horses; steps include collection, evaluation, and insemination

5. Parturition is the process of giving birth and is similar in most mammals. Most mares do not like an audience when foaling and will foal early in the morning. It is a good idea to be as inconspicuous as possible.

What takes place during parturition?

a) Waxing
b) Udder and vagina muscle changes
c) Three stages of birth
    1) Agitation and perhaps breaking of the water
    2) Labor and visible fetal membranes
    3) Presentation
d) Afterbirth expulsion, usually within 2-3 hours

6. Dystocia means having problems giving birth. Any time a mare strains or has contractions for an unusually long period of time, a veterinarian should be called to assist.

What is dystocia and how can it be handled?

a) Causes
    1) Abnormal presentation
    2) Unusually large foal
    3) Twins
b) Veterinarian help

7. Retained placenta can cause serious infections and make rebreeding difficult or even impossible. When parturition has been completed and the afterbirth delivered, the afterbirth should be removed from the stall and inspected for possible retained placenta.

Why is it important to check the afterbirth?

a) Retained placenta
    1) Consult a veterinarian.
    2) Do **not** try to pull the placenta yourself.
b) Avoid foaling founder (laminitis)

8. Ask students how colostrum differs from regular mare's milk.

What is colostrum and why is it important?

a) First milk lasts only 48 hours and is yellowish and thick.
b) Colostrum is higher in protein and antibodies than regular milk.

F. Other activities

1. If possible, observe an actual foaling.

2. Show the video, *Foaling* (16 minutes, AG video 216), available from the Missouri Vocational Resource Center.

G. Conclusion

Great care should be taken to assure the safety of the mare and the stallion during breeding. It is also important that a clean, dry, draft-free area be provided to the mare during foaling. No other process on earth is more breathtaking and mystifying than the process of birth.

H. Competency

Identify basic genetic and reproductive characteristics in the horse.

I. Answers to Assignment Sheet 4.1

1. h
2. a
3. k
4. j
5. d
6. f
7. e
8. c
9. i
10. g
11. d
12. a
13. c
14. g
15. e
16. h
17. k
18. l
19. i
20. b
21. j

J. Answers to Evaluation

1. d
2. c
3. a
4. b
5. d
6. c
7. d
8. b
9. c
10. b
11. b
12. a
13. c
14. d
15. a
16. d

Lesson 4: Genetics and Reproduction

Name ____________________

Reproductive Part Identification

Match the male reproductive body parts on the left with the illustration.

a. Bladder

b. Cervix

c. Cowper's gland

d. Penis

e. Prostate gland

f. Rectum

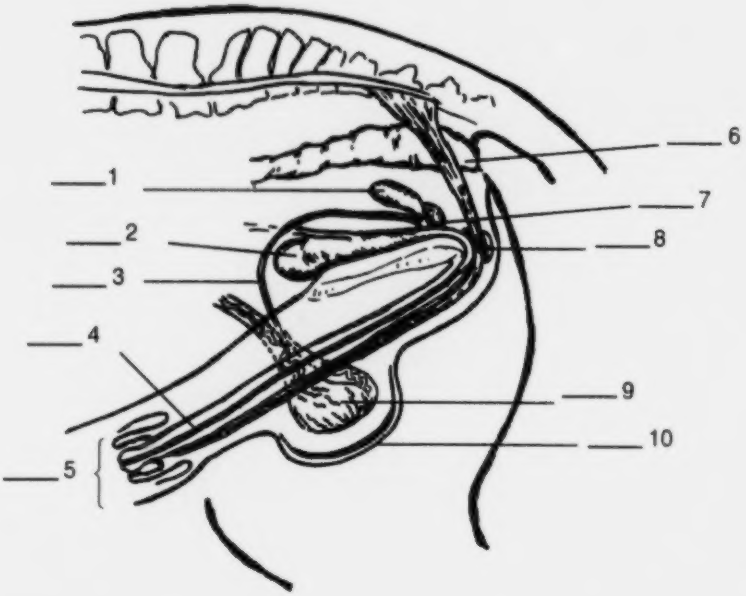
g. Scrotum

h. Seminal vesicle

i. Testicle

j. Urethra

k. Vas deferens



Match the female reproductive body parts below with the illustration that follows.

a. Body of uterus

b. Cervix

c. Fallopian tube

d. Kidney

e. Left uterine horn

f. Milk bag

g. Ovary

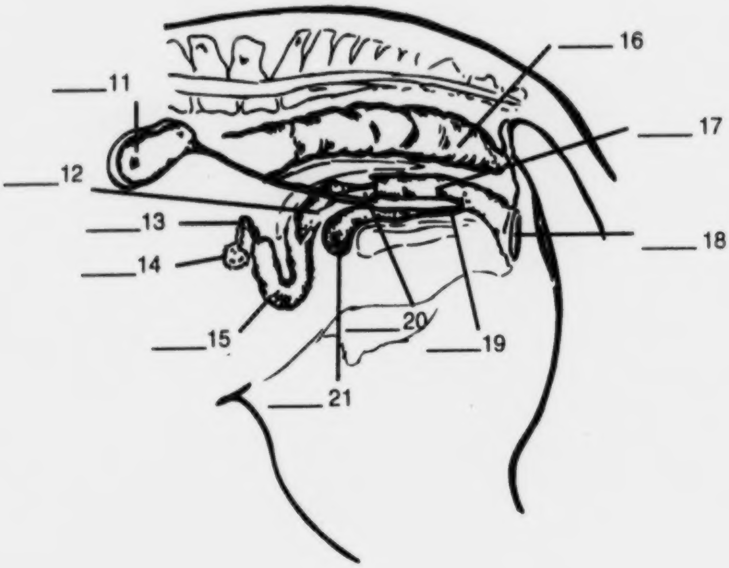
h. Rectum

I. Urethra

j. Urinary bladder

k. Vagina

l. Vulva



____11
____12
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____20
____21

UNIT - EQUINE SCIENCE

Name ____________________

Lesson 4: Genetics and Reproduction

Date ____________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. What kind of gene combination causes the foal to die?

    a. Bad
    b. Co-dominate
    c. Incomplete dominance
    d. Lethal

2. How many pairs of chromosomes does the horse have?

    a. 23
    b. 28
    c. 32
    d. 64

3. What do the mare's ovaries produce?

    a. Ova
    b. Semen
    c. Sperm
    d. Placenta

4. The cervix is a strong muscle that performs what function?

    a. Controls egg production
    b. Keeps foreign matter out of the uterus
    c. Serves as the birth canal
    d. Transports ova to the uterus

5. After the ova is expelled from the ovary, what does it travel through?

    a. Cervix
    b. Uterus
    c. Vagina
    d. Fallopian tube

6. What do the stallion's testicles produce?

    a. Fluids
    b. Eggs
    c. Sperm cells
    d. None of the above

7. The sperm is mixed with fluid from where?

a. Seminal vesicles
b. Prostate gland
c. Cowper's gland
d. All of the above

8. What is the most commonly used method of breeding?

a. Artificial insemination
b. Hand breeding
c. Natural breeding
d. None of the above

9. What are the three steps in using AI?

a. Collection, evaluation, and parturition
b. Insemination, evaluation, and parturition
c. Collection, evaluation, and insemination
d. Collection, parturition, and evaluation

10. What process is parturition?

a. Artificial insemination
b. Giving birth
c. Servicing the mare
d. Natural breeding

11. How soon after the foal's birth is the afterbirth usually expelled?

a. 1-2 hours
b. 2-3 hours
c. 3-4 hours
d. 4-5 hours

12. What color is colostrum?

a. Yellowish
b. Bluish
c. Reddish
d. Greenish

13. As compared to regular milk, which is true about colostrum?

a. Produced after regular milk
b. Lower in protein
c. Higher in antibodies
d. Not as important

14. What is dystocia?

    a. The process of giving birth
    b. The first milk let-down
    c. The results of lethal genes
    d. When a mare has difficulty giving birth

15. Which is **not** a cause of dystocia?

    a. Improper grooming
    b. Improper diet
    c. High birth weights
    d. Multiple births

16. What can a retained placenta cause?

    a. Mottled coat
    b. Nasal infection
    c. Multiple births
    d. Laminitis

UNIT - EQUINE SCIENCE

Lesson 5: Herd Health

Objective: The student will understand what is involved in a herd health program and why it is important.

Study Questions

1. **Why is it important to develop a herd vaccination program?**
2. **For what diseases should horses be vaccinated?**
3. **What are some other ailments, their treatment, and prevention?**
4. **What is the importance of proper dental care?**
5. **What is the importance of parasite control?**
6. **What are some basic first aid steps?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. Transparency Master
    a) TM 5.1: Internal Parasites (Roundworms)
3. Activity Sheet
    a) AS 5.1: Microscope Use

UNIT - EQUINE SCIENCE

Lesson 5: Herd Health

TEACHING PROCEDURES

A. Review

Review Lesson 2 (safe handling of horses) and Lesson 3 (aging effects on teeth).

B. Motivation

Provide several pictures of horses suffering from various illnesses. Ask students for any personal experiences with their own animals and illnesses they have encountered.

C. Assignment

D. Supervised study

E. Discussion

1. Unlike the earlier part of this century, many diseases are preventable today by using vaccines. There is no reason for a horse to suffer a disease such as tetanus when a simple vaccination can prevent it.

   Why is it important to develop a herd vaccination program?

   a) Economics involved
   b) Types of vaccines
   c) Providing maximum protection against diseases

2. There are several types of vaccines used today, and each has its own effectiveness. A veterinarian who is knowledgeable in equine medicine can recommend preventive measures for common diseases in the area.

   For what diseases should horses be vaccinated?

   a) Influenza
   b) Sleeping sickness (EEE, WEE, and/or VEE)
   c) Tetanus (lockjaw)
   d) Viral rhinopneumonitis (Rhino)
   e) Strangles (distemper)
   f) Rabies (where recommended)
   g) Potomac Horse Fever--symptoms of fever, depression, loss of appetite, colic, edema (swelling) of the underline (belly), diarrhea

3. There are many ailments that a horse can contract. Some of the more common ones are listed below.

   What are some other ailments, their treatment, and prevention?

a) Colic--symptoms include pawing at the ground, looking nervously at the flanks, continually lying down and getting back up, rolling, sweating, constipation, and the absence of normal intestinal sounds
b) Equine Infectious Anemia (EIA or swamp fever)--serious blood disease
c) Salmonella--symptoms resemble those of colic

4. Providing regular dental care is important. As a horse's teeth wear, sharp edges can form, causing cuts or sores in the mouth that interfere with mastication. Have students review the section in Lesson 3 that deals with teeth.

What is the importance of proper dental care?

a) Aging process changes
   1) Floating teeth (filing off sharp edges)
   2) Normal wear vs. problems
b) Weight and conditioning maintenance

5. Parasites are a constant problem for any animal. Treatment or prevention must be taken to protect the animal from contracting a serious illness from parasites. Use TM 5.1 to show the infestation of an intestine by roundworms, or show photos from other resources of an infected horse.

What is the importance of parasite control?

a) Control internal parasites by deworming and keeping environment clean.
b) Control external parasites by keeping environment clean and using insecticide.

6. First aid is the quick, immediate, and temporary assistance given to a sick or injured animal. Remember that professional assistance should be sought as soon as possible, and that even a relatively minor incident can lead to deadly complications. When unsure about an injury's seriousness, contact a veterinarian.

What are some basic first aid steps?

a) Medical equipment (first aid kit)
b) Bleeding--controlled by first applying gauze and pressure to the wound
c) Foot punctures
d) Bites and stings
e) Swelling, strains, and sprains
f) Founder

F. Other activities

1. Visit an equine hospital.

2. Invite a veterinarian to visit the class.

3. If possible, obtain samples of various preserved parasites.

G. Conclusion

Whether a person has two horses or 20, managing their health is extremely important. Knowing what is normal for each animal is vital to early diagnosis and treatment of any illness or injury.

H. Competency

Develop a herd health program.

I. Answers to Activity Sheets

PART C

1. It seemed to move to the left. It seemed to move in the opposite direction.
2. It is actually moving from the bottom to the top.
3. It may move out of the field of view because of its original position in the field of view.
4. The magnification rate reduces the light.
5. Low power is usually 100x magnification.
6. High power magnifies the image anywhere from 400X to 440X, depending on the microscope being used.

PART D

1. As you change the focus of the lens, one strand will go out of focus, and another one then comes into sharp focus.
2. The greater the depth of field, the more of the specimen that will be in focus. As the resolution of the lens changes, the depth of focus also change.
3. As the objective is switched to high power, the focusing ability is greatly narrowed. The depth of field is reduced, and the focusing range is very narrow and hard to focus.

I. Answers to Evaluation

1. a
2. c
3. c
4. b
5. d
6. c
7. a
8. d
9. a
10. d
11. c
12. a
13. a

Lesson 5: Herd Health

Name ______________________________

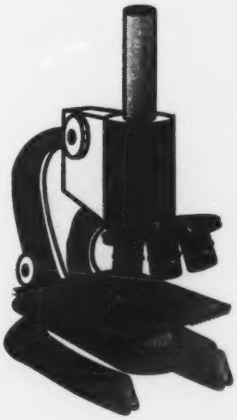
Microscope Use

Objectives: Students will identify parts of the microscope, adjust the microscope and prepare slides to study different materials that affect agriculture.

Activity Length: Preparation time: 20 min.
Class time: 50 min.

Materials and Equipment:

Compound microscope
Cloth or paper towel
Medicine dropper
Lens paper
Scissors
Dish soap
Glass slide
Coverslip
Horse hair
Small hoof pieces
Small manure samples
Rubber gloves
Probe
Water
Absorbent cotton



PART A: Microscope parts and handling

Procedure:

1. To move the microscope, place one hand beneath the base and firmly grasp the arm of the microscope with the other hand.

2. Place the microscope on the table with the arm toward you and the stage away from you. The base should be about 8-10 cm from the table's edge.

3. As directed by the instructor, identify the parts of the microscope.

Vocabulary Terms:

Arm	supports the body tube.
Base	supports the microscope.
Body tube	maintains a set distance between the eyepiece and objective lens.
Coarse focus	moves the body tube up and down.
Coverslip	thin piece of glass or plastic that is placed over the specimen on the slide.
Diaphragm	regulates light from the mirror or light source.
Eyepiece	contains lenses for magnification.
Fine focus	focuses and sharpens the image.
Mirror or light	provides light to illuminate specimen.
Nosepiece	contains high- and low-power objective lenses.
Objective (lens)	the microscope lens nearest to the object observed; focuses light to form the image of the object.
Resolution	capability of a microscope to provide fine detail.
Slide	small glass or plastic plate used to mount objects to be examined under a microscope.
Stage	supports the slide being viewed.
Stage clips	holds the slide in place on the stage.
Turret	rotating wheel on which objective lenses are mounted.
Working distance	space between the lens and the top of the coverslip.

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PART B: Preparing wet-mount slide

Procedure:

NOTE: Specimens observed though a microscope are placed on a glass slide. A coverslip is placed over the specimen on the slide. Water is usually placed between the slide and the coverslip.

1. Rinse a slide in soapy water. Gently wipe both sides of the slide with a clean paper towel.

2. To prevent smudges, always handle slides by the edge rather than the flat surface.

3. Place the horse hair or manure sample in the center of the slide. (Use rubber gloves when handling manure.) Use a medicine dropper to place a drop of water in the center of the slide.

4. Place the coverslip at a 45-degree angle over the drop of water and the paper. With the probe, gently lower the coverslip into position on the slide.

5. If air bubbles are present, gently tap the coverslip directly over the air bubbles with the eraser of a pencil.

6. Clip the slide to the stage with the stage clips.

PART C: Focusing the microscope

Procedure:

1. Using the coarse focus, raise the body tube of the microscope until the objective lens is 2-3 cm above the opening in the stage.

2. Revolve the nosepiece so the low-power objective (10X) "clicks" and locks directly in line with the body tube.

3. Adjust the diaphragm so the greatest amount of light is coming through the opening in the stage.

4. Looking from the side, use the coarse focus to lower the body tube as far as it will go without hitting the slide. **Do not force the body tube.**

5. Look through the eyepiece. Using the coarse adjustment, focus until the object comes into view.

6. Use the fine focus knob to bring the object into proper focus.

7. Sketch the object as you see it under low power.

8. Move the slide toward your right.

9. Move the slide away from the microscope arm. Recenter the slide.

10. Rotate the turret to the high-power lens and focus with the fine-focus knob.

11. Compare your observations of the object under high and low power.

12. Sketch the object under high power.

13. Compute the total magnification image by multiplying the eyepiece magnification by the magnification of the objective lens. The magnification rate of the lenses of your microscope should be imprinted on the barrel of the lens.

Key Questions:

1. What happened to the first object when you moved the slide to the right? ____________________

____ Away from the microscope arm?

____

2. If you see a living organism moving from the top to the bottom of the field of view, what do you know about the organism's direction of travel? ____________________________

____

____

3. How did the first object change position upon switching to high power? ____________________

____

4. Why did the field of view get dimmer as you switched to high power? ____________________

____

5. What is the total magnification of the image with the microscope on low power? ______________

____

6. What is the total magnification of the image with the microscope on high power? ______________

PART D: Resolving power and depth of focus

Procedure:

1. Prepare a wet mount of a small hoof scraping.
2. Observe the hoof piece with low power and then with higher power.
3. Sketch the piece as observed in the field of view with both powers.

Key Questions:

1. How can you decide which hoof piece overlays another? ______________________________

   ____

2. In microscope observations, why is it important to resolve power and depth of focus problems? ____

   ____

   ____

3. How does the focusing ability change when the objective is switched from low to high power? _____

   ____

Supplemental References:

Agriscience Activity Manual. Pierre: South Dakota Curriculum Center, 1994.

Lee, J. S., and D. L. Turner. *Introduction to World AgriScience and Technology (Activity Manual).* Danville, IL: Interstate Publishers, Inc., 1994.

Thompson, Greg. *Agricultural Science Lab Activities.* University of Missouri-Columbia: Instructional Materials Laboratory, 1994.

UNIT - EQUINE SCIENCE Name ______________________________

Lesson 5: Herd Health Date ______________________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. What can be done to prevent horses from contracting certain diseases?

   a. Vaccinate against them.
   b. Don't have horses.
   c. Put goats with the horses.
   d. Keep mares and geldings separated.

2. Which are three diseases for which horses are commonly vaccinated?

   a. Influenza, sleeping sickness, and measles
   b. Influenza, sleeping sickness, and mumps
   c. Sleeping sickness, tetanus, and influenza
   d. Tetanus, mumps, and influenza

3. For what diseases should horses be vaccinated?

   a. Everything that there is a vaccine for
   b. For every disease common to the U.S.
   c. According to veterinarian recommendations
   d. None of the above

4. Which describes the process of floating a horse's teeth?

   a. Washing them with water
   b. Filing them
   c. Pulling them
   d. None of the above

5. What is another name for strangles?

   a. Choking disease
   b. Strangling disease
   c. Breathing disease
   d. Distemper

6. What does EIA (swamp fever) affect in horses?

   a. Liver
   b. Lung
   c. Blood
   d. Heart

7. Lockjaw is another name for which disease?

   a. Tetanus
   b. Rabies
   c. Sleeping sickness
   d. Influenza

8. What does Potomac horse fever cause?

   a. A fever
   b. Loss of appetite
   c. Diarrhea
   d. All of the above

9. What are the two classifications of parasites?

   a. Internal and external
   b. Internal and intestinal
   c. External and extraterrestrial
   d. None of the above

10. How are internal parasites controlled?

   a. Using a dewormer
   b. Keeping stalls clean
   c. Dragging the fields
   d. All of the above

11. Which describes first aid?

   a. Quick and immediate aid instead of a veterinarian
   b. Quick and immediate aid until the arrival of a veterinarian
   c. Quick and temporary aid of an injured animal
   d. Permanent aid of an animal

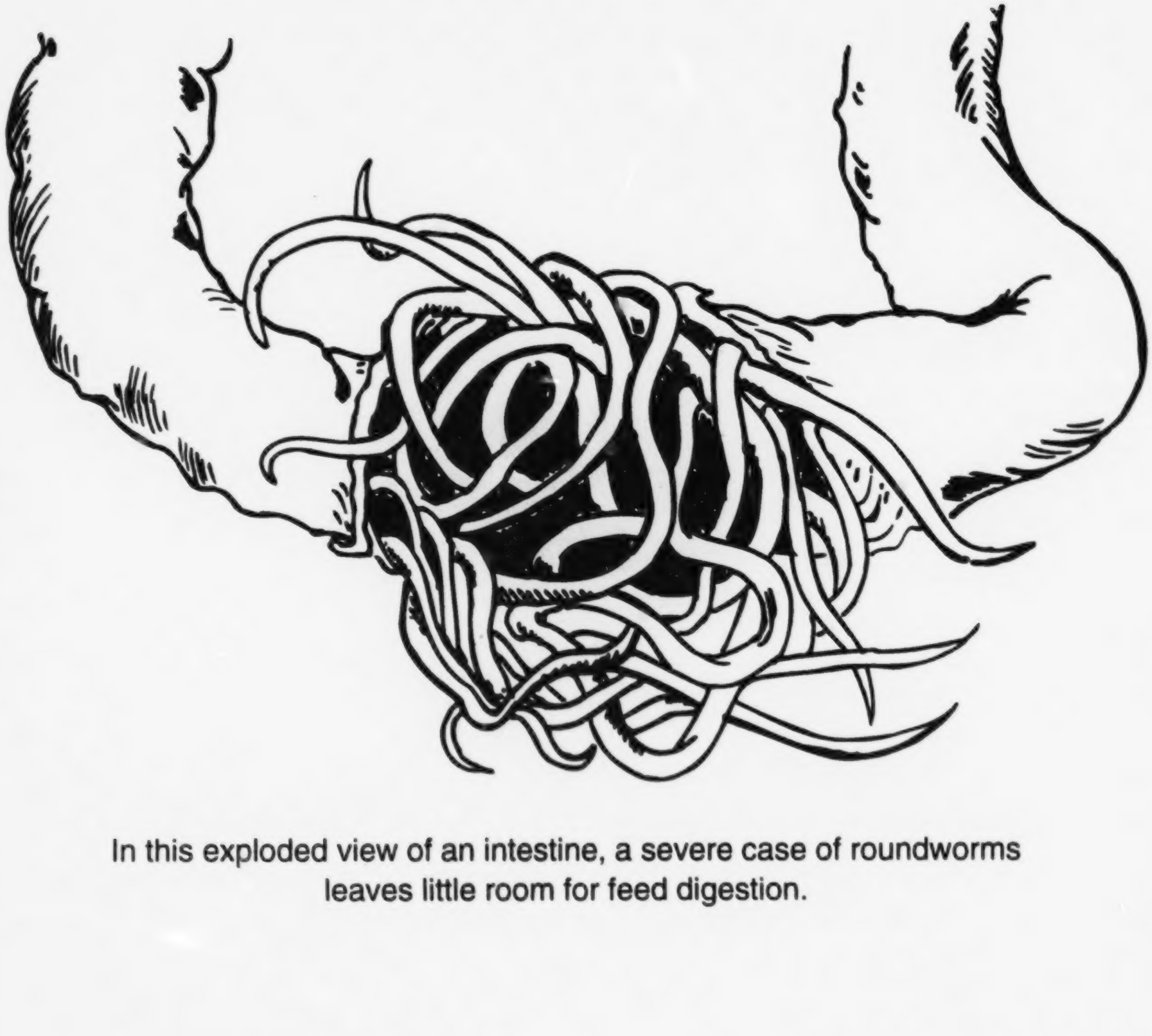
12. What is the first step to take when an animal is bleeding?

   a. Stop or control the bleeding.
   b. Call the veterinarian.
   c. Put a bandage on.
   d. None of the above

13. When should a veterinarian be called?

   a. When unsure about an injury's seriousness
   b. Every day
   c. For all injuries
   d. None of the above

Internal Parasites (Roundworms)



In this exploded view of an intestine, a severe case of roundworms leaves little room for feed digestion.

UNIT - EQUINE SCIENCE

Lesson 6: Hoof Care

Objective: The student will be able to identify the various structures of the hoof, along with care of the hoof and associated health problems.

Study Questions

1. **What structures make up the hoof?**
2. **What is looked for when inspecting the hoof?**
3. **When is trimming necessary?**
4. **What are the various ways of shoeing?**
5. **What are some hoof abnormalities?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. *Fundamental Horse Hoof Care* (38 minutes, AG video 215), available from the Missouri Vocational Resource Center.
3. Transparency Masters
    a) TM 6.1: External Parts of the Foot (Side View)
    b) TM 6.2: External Parts of the Foot (Bottom View)
    c) TM 6.3: Internal Parts of the Foot
4. Assignment Sheets
    a) AS 6.1: External Parts of the Foot
    b) AS 6.2: Internal Parts of the Foot

UNIT - EQUINE SCIENCE

Lesson 6: Hoof Care

TEACHING PROCEDURES

A. Review

Review Lesson 5.

B. Motivation

Use a hoof model with a cutaway section that shows the inner structures of the hoof. Also, display photographs of injured and diseased hoofs. Ask students if they have had any experiences with lame horses.

C. Assignment

D. Supervised study

E. Discussion

1. The hoof is a complex structure. It consists of four major bones that provide support and locomotion. These bones are the cannon, pastern, coffin, and navicular. Use TM 6.1, TM 6.2, and TM 6.3 to aid the discussion. Have students do AS 6.1 and 6.2.

What structures make up the hoof?

a) Cannon
b) Pastern
c) Coffin
d) Navicular
e) Comet band
f) Hoof wall
g) Frog
h) Cleft
i) Heel

2. Regular inspection of the hoof is important to the horse's health. There is an old saying: "A horse is only as good as its feet." Stress to students the importance of good care for the horse's feet.

What is looked for when inspecting the hoof?

a) Thrush
b) Chipping
c) Drying out
d) Cracks
e) Prevention
f) Maintenance
g) Cleaning

3. The outer wall of the hoof grows about 3/8" per month. If the horse is kept in a barn or doesn't have adequate room to run and naturally keep hoofs worn down, they will need monthly trimming by the owner.

   When is trimming necessary?

   a) Nipping
   b) Filing
   c) Quicking
   d) Rules of thumb

4. In the wild, horses do not need trimming or shoeing. Shoeing is the result of the domestication of the horse and its resulting uses. Proper shoeing is vital to the horse's health and should be done by a qualified farrier. Improper shoeing can lead to serious problems.

   What are the various ways of shoeing?

   NOTE: Whichever method is used, shoeing should only be done by a skilled farrier.
   a) Methods
      1) Hot shoeing involves heating a horseshoe and shaping and sizing it to the hoof's shape.
      2) Cold shoeing shapes and sizes the shoe without heating it.
   b) When shoeing is necessary
      1) When trail riding to protect the hoof from excessive wear
      2) For corrective measures, such as stance or gait defects, hoof wall cracks, stone bruises, and tendonitis

5. The hoof is the most important part of a horse's body. Abnormalities must be treated quickly, or there is the risk of permanent damage or even death.

   What are some hoof abnormalities?

   a) Lameness - any disorder that causes the horse to have sensitive or sore hooves. Treatment depends on the exact condition.
   b) Stone bruise - a bruising of the sole that can lead to an abscess. This condition is caused by impact with a hard object, such as a stone.
   c) Founder (laminitis) - a condition that can be caused by several things, such as overfeeding of grain or lush legume or fescue, watering while the animal is hot, or inflammation of the uterus after the mare has foaled. In founder, the laminae become inflamed.
   d) Naviculitis - inflammation of the navicular bone. In some cases, the bone can rotate downward. This disease's cause is difficult to determine and difficult to treat. Treatment involves special shoeing or in some cases nerve deadening by a veterinarian.
   e) Hoof cracks - vertical cracks in the outer surface of the hoof wall. This can be caused by excess drying and can be prevented by using hoof dressing.
   f) Thrush - caused by an anaerobic bacteria that grows around the frog and produces a foul odor. Unsanitary stalls are usually the cause of this disease, and it can be treated easily with bleach or an over-the-counter drug. Prevention (by keeping stalls clean and dry) is the best solution.

F. Other activities

1. Have students pick out and clean a hoof.

2. Arrange for a farrier to demonstrate shoeing.

3. If accessible, arrange for students to visit a veterinarian clinic or hospital and see horses with hoof abnormalities.

4. Bring in samples of different horseshoes and relate how they help correct various problems.

5. Check with a local veterinarian for a hoof from a deceased horse. This hoof can be used to show the relationship of hoof parts to each other and effects of naviculitis or laminitis.

G. Conclusion

The hoof is an important structure that makes or breaks a horse. Regular inspections should be done; cleaning, trimming, and shoeing should be done when needed.

H. Competency

Discuss hoof structures and care.

I. Answers to Assignment Sheets

AS 6.1:
1. a
2. d
3. f
4. b
5. e
6. g
7. d
8. a
9. f
10. e
11. c
12. g

AS 6.2:
1. e
2. d
3. c
4. g
5. a
6. f
7. h
8. b

J. Answers to Evaluation

1. b
2. c
3. d
4. b
5. a
6. a

7. Any two of the following:
   a) Lameness - any disorder that causes the horse to have sensitive or sore hooves. Treatment depends on the exact condition.
   b) Stone bruise - a bruising of the sole that can lead to an abscess. This condition is caused by impact with a hard object, such as a stone.
   c) Founder (laminitis) - a condition that can be caused by several things, such as overfeeding of grain or lush legume, watering while the animal is hot, or inflammation of the uterus after the mare has foaled. In founder, the laminae becomes inflamed.
   d) Naviculitis - inflammation of the navicular bone. In some cases, the bone can rotate downward. This disease's cause is difficult to determine and difficult to treat. Treatment involves special shoeing or in some cases nerve deadening by a veterinarian.
   e) Hoof cracks - vertical cracks in the outer surface of the hoof wall. This can be caused by excess drying and can be prevented by using hoof dressing.

8. Cold shoeing is done with preformed shoes, while hot shoeing involves making the shoe from scratch in a forge.

9. Thrush is a fungus cause by wet conditions. It has a distinguishable odor and can be prevented by keeping stalls clean and dry. Treatments include a mild chlorine bleach solution.

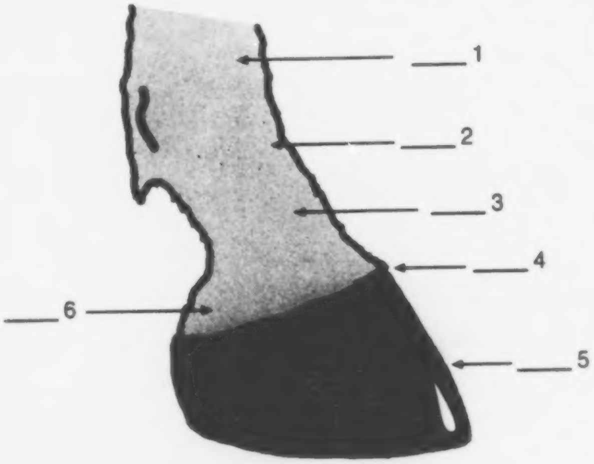
10. d
11. a
12. f
13. e
14. g
15. c

Lesson 6: Hoof Care

Name________________

External Parts of the Foot

Match the foot parts on the right with the illustration on the left.



a. Cannon

b. Coronary band

c. Deep flexor tendon

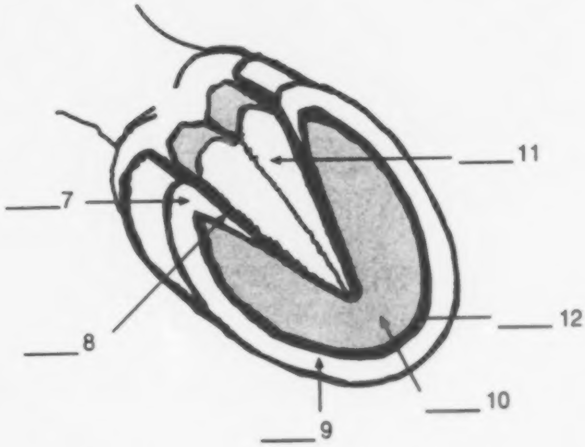
d. Fetlock

e. Hoof wall

f. Pastern

g. Perioplic ring

Match the foot parts on the right with the illustration on the left.



a. Bar

b. Coffin joint

c. Frog

d. Heel

e. Sole

f. Wall

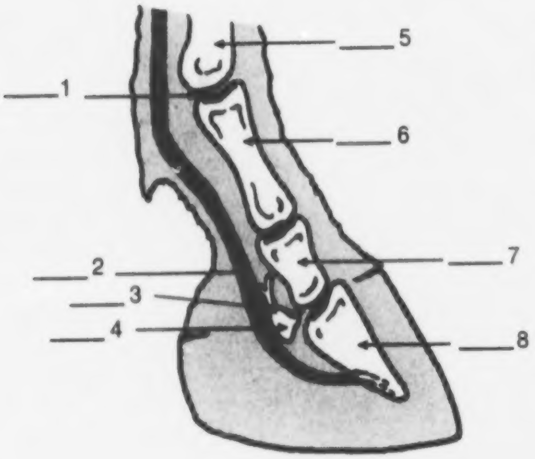
g. White line (lamina)

UNIT - EQUINE SCIENCE AS 6.2

Lesson 6: Hoof Care Name________________

Internal Parts of the Foot

Match the foot parts on the right with the illustration on the left.



a. Cannon bone
b. Coffin bone
c. Coffin joint
d. Deep flexor tendon
e. Fetlock joint
f. Long pastern
g. Navicular bone
h. Short pastern
I. White line (lamina)

UNIT - EQUINE SCIENCE Name ____________________

Lesson 6: Hoof Care Date ____________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. What should be looked for when inspecting a horse's hoof?
    a. Worms
    b. Chipping
    c. Signs of weight gain
    d. Poor coat

2. What is a major cause of thrush?
    a. Poor diet
    b. Bad hay
    c. Wet stall
    d. Excess weight

3. How often should horses have their hoofs trimmed?
    a. Twice a year
    b. Once a year
    c. Twice a month
    d. Once a month

4. About how much does a horse's hoof grow?
    a. 1/8" per month
    b. 3/8" per month
    c. 1" per month
    d. 3" per year

5. Why should shoeing be done?
    a. Protect the hoof from excessive wear
    b. Add flair while showing
    c. Add sound when horses walk
    d. Increase their height

6. Why should corrective shoeing be done?
    a. Correct defects
    b. Prevent founder
    c. Stop thrush
    d. For pastured horses

Complete the following short answer questions.

7. Other than thrush, list two hoof abnormalities. Describe symptoms and causes of each.

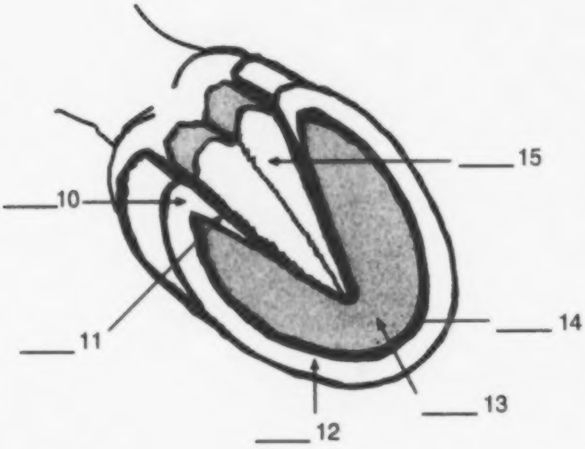
   a.

   b.

8. What is the main difference between hot shoeing and cold shoeing?

9. Give a complete description of thrush, what causes it, and how it is prevented.

Match the hoof parts on the right with the illustration on the left.



a. Bar

b. Cannon bone

c. Frog

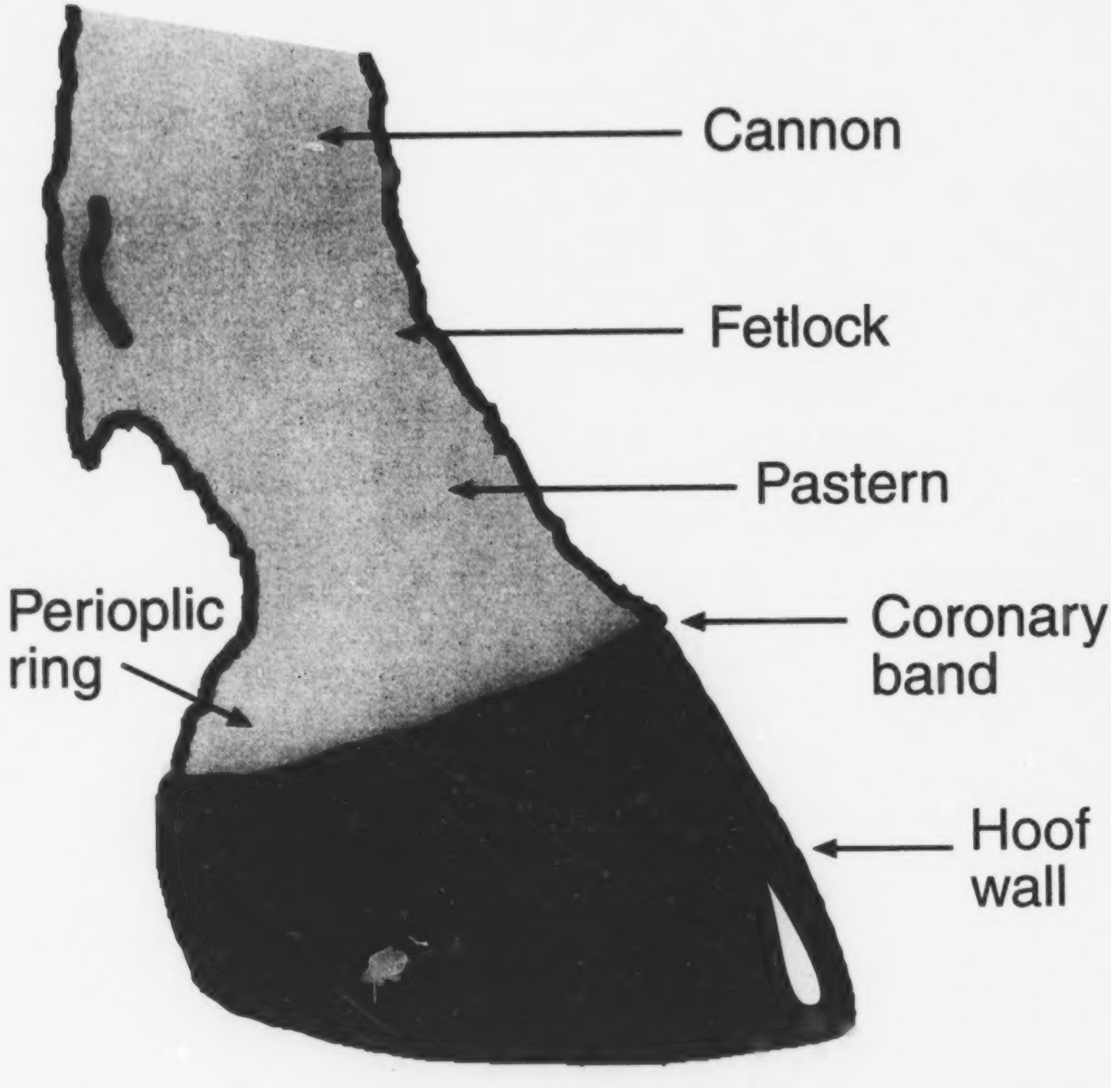
d. Heel

e. Sole

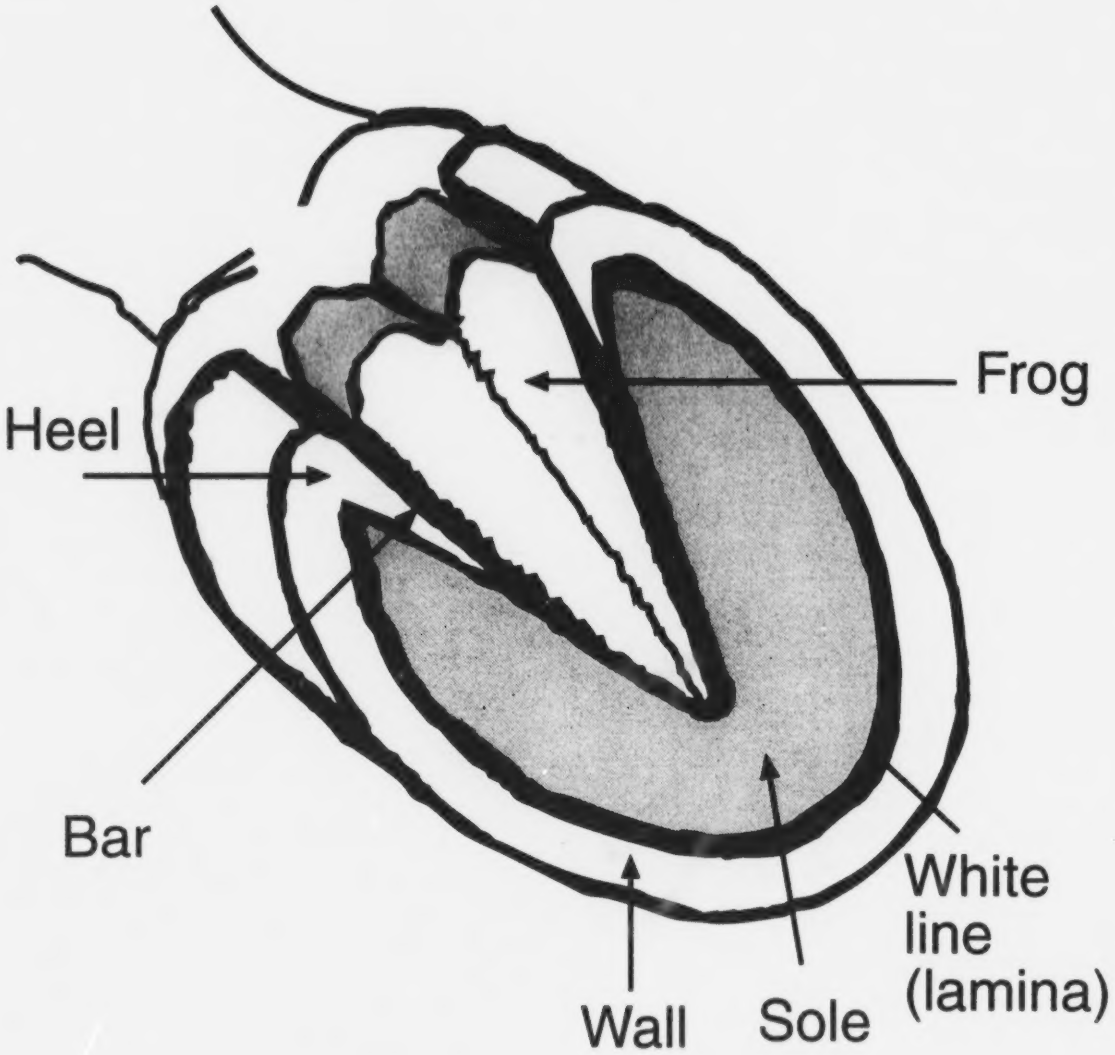
f. Wall

g. White line (lamina)

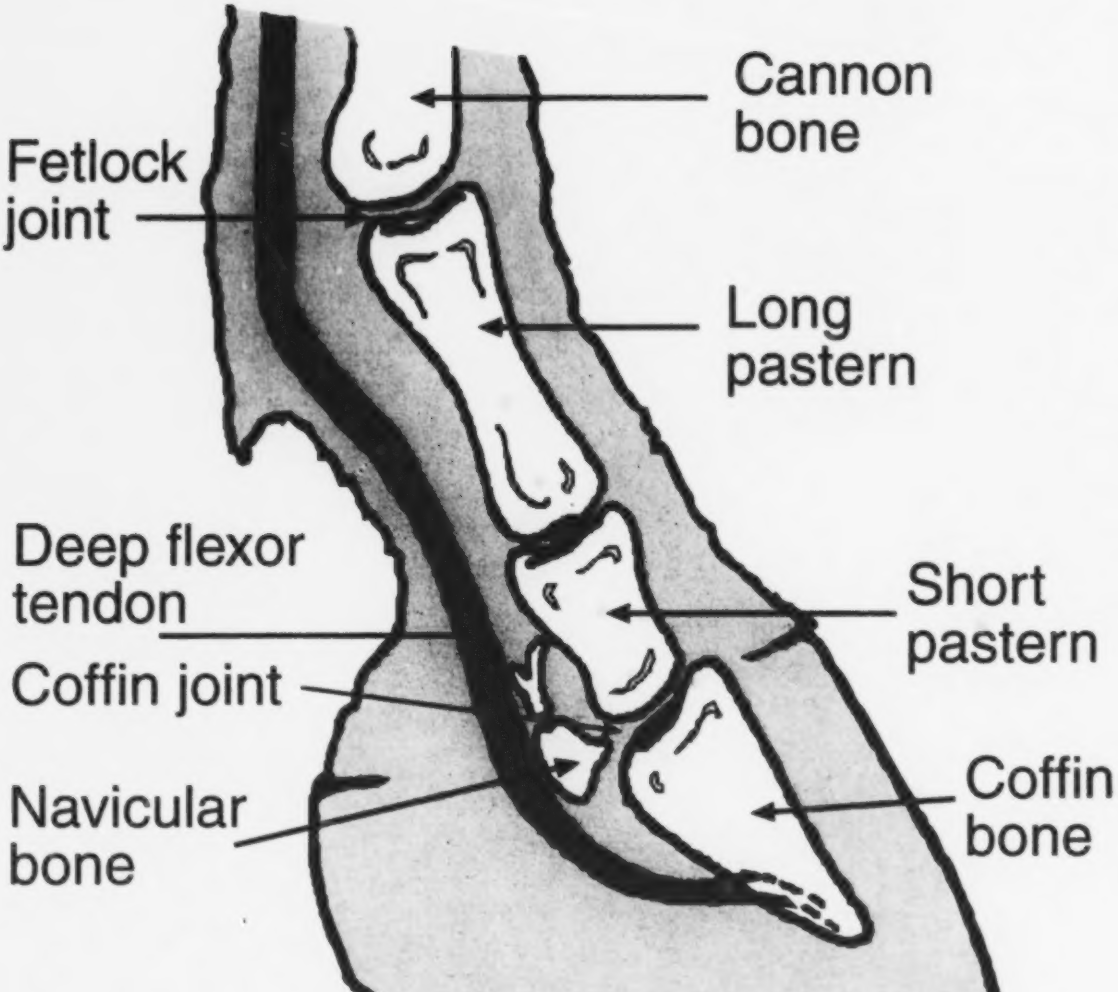
External Parts of the Foot (Side View)


Cannon
Fetlock
Pastern
Periopic ring
Coronary band
Hoof wall

External Parts of the Foot (Bottom View)


Frog
Heel
Bar
White line (lamina)
Wall
Sole

Internal Parts of the Foot


Cannon bone
Fetlock joint
Long pastern
Deep flexor tendon
Short pastern
Coffin joint
Navicular bone
Coffin bone

UNIT - EQUINE SCIENCE

Lesson 7: Nutrition

Objective: The student will understand parts of the horse's digestive tract and what the different nutritional requirements are for different horses.

Study Questions

1. **Describe the anatomy and function of the simple digestive tract.**
2. **What causes colic?**
3. **How are the nutritional requirements determined for foals, yearlings, two-year-olds, breeding stock, and mature horses?**
4. **What factors affect digestion?**
5. **What is the importance of water?**
6. **What are some different feed types?**
7. **What determines which feeds are used and when they are used?**
8. **What nutrition-related problems can arise?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publication
    a) G2807: Feeding Horses

UNIT - EQUINE SCIENCE

Lesson 7: Nutrition

TEACHING PROCEDURES

A. Review

Review colic from Lesson 5 and founder from Lesson 6.

B. Motivation

Obtain models or actual digestive tracts of a horse and a cow. Have students compare the two structures and note similarities and differences.

C. Assignment

D. Supervised study

E. Discussion

1. The digestive tract includes everything from the mouth to the rectum. Understanding how the horse's digestion takes place is an important part of being able to feed it properly.

Describe the anatomy and function of the simple digestive tract.

a) Differences between horses and other livestock
    1) The capacity of the horse's stomach is 8-16 quarts, as compared to the cow's (about 200 quarts) and the pig's (about 6-8 quarts).
    2) A cow has a four-chambered stomach, while the horse and hog have only one.
    3) Therefore, the horse's digestive tract more closely resembles the pig's.
    4) Horses have a larger cecum than cattle or hogs.
b) Where digestion takes place
    1) Mouth (mastication)
    2) Stomach
    3) Small intestine
    4) Cecum (water gut)--fermentation
    5) Large intestine
    6) Enzymes from liver and pancreas

2. Colic is a general term meaning pain in the abdomen.

What causes colic?

a) Frequently caused by overfeeding
b) Can cause intestinal blockage
c) Can be fatal

3. Nutritional requirements differ from horse to horse. A foal requires different amounts of nutrients than does a yearling, two-year-old, or a mature animal. It also makes a difference whether or not animals are breeding, pregnant, working, or just out to pasture.

How are the nutritional requirements determined for foals, yearlings, two-year-olds, breeding stock, and mature horses?

a) By the horse's size and age
b) By work load and breeding status
c) By stress level and quality of feed
d) By weather conditions

4. The horse's digestive system, unlike the cow's, is designed to take in small amounts of feed at a nearly constant rate. The horse's stomach empties completely in about 24 hours, while a cow's takes about three times as long.

What factors affect digestion?

a) Stress
b) Feed quality
c) Efficiency of digestion (30 percent)

5. Of all the nutrients required by the horse, water is probably the most important and least expensive one. Horses consume 10-12 gallons of water per day, depending on the temperature and how active they have been. Water intake should be limited before and after heavy exercise.

What is the importance of water?

a) Functions throughout the body
b) Water supply requirements
    1) Cleanliness
    2) Freshness
    3) Free choice availability

6. There are two main types of feeds: grains and hay (roughage). Oats and corn are the most commonly fed grains. In hay, a horse needs only about 1 percent of its body weight daily.

What are some different feed types?

a) Grains
b) Hay (roughage)
c) Supplements
d) Minerals
e) Vitamins

7. Today, more and more feeds are premixed to save the customer's time. This means, however, that the horse is getting the nutrients the manufacturer produces, instead of what it really needs.

What determines which feeds are used and when they are used?

a) Availability
b) Cost of feed stuff
c) Requirements and needs of the animal
    1) Age
    2) Health conditions

8. In the wild, the horse ate many small meals instead of one or two meals a day, as owners prefer to feed. The wild horse had few nutrition-related difficulties, while domesticated horses are

prone to many digestion problems. Colic and founder are the most common digestion difficulties but are easily prevented.

What nutrition-related problems can arise?

a) Laminitis (founder)
b) Colic
c) Epiphysis
d) Vitamin deficiency (such as rickets)
e) Toxic plants
f) Blister beetles in alfalfa hay
g) Tying up

F. Other activities

Show the video, *Equine Nutrition: The Art, Science and Common Sense of Feeding Horses* (65 minutes, AG video 191), available from the Missouri Vocational Resource Center.

G. Conclusion

In the wild, the horse was able to take care of all its needs and usually had few problems. The domesticated horse depends on people to provide all its nutritional needs. It is the responsibility of the owner to make sure the horse has the proper nutrition at all times.

H. Competency

Identify a ration to meet the nutritional needs of horses.

I. Answers to Evaluation

1. c
2. b
3. a
4. d
5. d
6. c
7. a
8. c
9. c
10. c
11. a
12. a
13. b
14. a
15. d

UNIT - EQUINE SCIENCE

Lesson 7: Nutrition

Name ______________________

Date ______________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. Where does fermentation take place?

   a. Stomach
   b. Liver
   c. Cecum
   d. Large intestine

2. Approximately how much does a horse's stomach hold?

   a. 5-10 quarts
   b. 8-16 quarts
   c. 55 quarts
   d. 5 gallons

3. What does colic mean?

   a. Abdominal discomfort
   b. Tooth decay
   c. Founder
   d. None of the above

4. How often do horses naturally eat?

   a. 2 times a day
   b. 3 times a day
   c. 4 times a day
   d. Almost continually

5. How are nutritional requirements determined?

   a. By the horse's size and age
   b. By work load and breeding status
   c. By stress level and quality of feed
   d. All the above

6. How much time does the horse's stomach take to empty?

   a. 6 hours
   b. 12 hours
   c. 24 hours
   d. 72 hours

7. How much of its food can a horse break down?

   a. 30 percent
   b. 40 percent
   c. 50 percent
   d. 70 percent

8. What is the cheapest and most important nutrient?

   a. Grains
   b. Hay
   c. Water
   d. Minerals

9. The horse will drink as many as ___ gallons per day.

   a. 5
   b. 8
   c. 12
   d. 20

10. After a horse has been working hard and is hot, what should be done?

    a. Let it drink as much as it wants.
    b. Don't let it drink at all.
    c. Let it have only small amounts of water.
    d. None of the above

11. What are the two most common feeds for horses?

    a. Oats and corn
    b. Oats and rice
    c. Corn and rice
    d. Oats and milo

12. How much hay should a horse be fed per day?

    a. 1 percent of its body weight
    b. 5 percent of its body weight
    c. 10 percent of its body weight
    d. 50 percent of its body weight

13. What are the two most common diseases related to nutrition?

    a. Epiphysis and worms
    b. Colic and founder
    c. Colic and worms
    d. Founder and worms

14. What two nutrition-related problems are easy to avoid?

   a. Colic and founder
   b. Colic and worms
   c. Founder and worms
   d. Epiphysis and colic

15. Which is unimportant when determining which feeds are used?

   a. Availability
   b. Cost of feed stuff
   c. Health conditions
   d. Brand name

UNIT - EQUINE SCIENCE

Lesson 8: Equipment and Facilities

Objective: The student will become familiar with various types of equipment and facilities, along with their proper care and use.

Study Questions

1. **What are the various types and uses of tack?**
2. **How is tack properly fitted and adjusted?**
3. **What are some different bits, and how do they work?**
4. **What are the various types of reins?**
5. **What are some different types of equipment and their uses?**
6. **How does the type of equipment and facility affect cost?**

References

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publication
   - a) G2844: Haltering and Tying Horses
   - b) G2845: Choosing, Assembling and Using Bridles
3. Ensminger, M. Eugene. *Horses and Horsemanship.* 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.
4. Assignment Sheet
   - a) AS 8.1: Identifying Tack Parts

UNIT - EQUINE SCIENCE

Lesson 8: Equipment and Facilities

TEACHING PROCEDURES

A. Review

Review Lesson 7.

B. Motivation

Have several pieces of equipment on display (e.g., halter, saddles, blankets, spurs, bridles, first aid equipment) and discuss their uses and applications.

C. Assignment

D. Supervised study

E. Discussion

1. Point out any unusual features or characteristics of the various types of tack. Use TM 8.1, 8.2, 8.3, and 8.4 to aid the discussion. Have students complete AS 8.1, 8.2, 8.3, 8.4, 8.5, and 8.6. Provide opportunity for students to examine the pieces on display. Discuss various styles of tack on the market and their price differences.

What are the various types and uses of tack?

a) Styles
    1) Western (show use vs. work)
    2) English (show use vs. work)
b) Halters and bridles
    1) Communicate cues to the horse
    2) No bit on a halter
c) Saddles
    1) The Western saddle has a high pommel and cantle.
    2) English saddles look almost flat.
d) Saddle pads
e) Blankets
f) Splints
g) Spurs

2. Tack must be properly fitted to both horse and rider. Improperly fitted equipment can be hazardous and cause injuries to the rider and/or horse. Select different pieces of tack, and demonstrate the adjustments. Have students practice with the tack so they can become familiar with it. Discuss the costs involved in purchasing tack and why it should be purchased.

How is tack properly fitted and adjusted?

a) Animal size
    1) Girth--Girth straps should be tightened firmly.
    2) Height of withers--The saddle's gullet should be above the horse's withers without rubbing them.

        3) Throat latch strap--Should be loose enough to allow two or three fingers between it and the horse's jaw
        4) Overall size--Pony, horse, draft (frequently not interchangeable)
    b) Style of equipment

3. Bits are the mechanical means from which cues are communicated to the horse from the rider. Ask students to explain the parts of different bits and how they work.

   What are some different bits, and how do they work?

   a) Work by acting on pressure points on the horse's head
   b) The smaller the diameter, the harsher the bit
   c) Types
      1) Snaffle
      2) Curb
      3) Pelham
      4) Rearing
      5) Hackamore
      6) Bosal

4. Reins are the connection between the bit and the rider. Discuss the different types of reins and how they work with the bit.

   What are the various types of reins?

   a) Split reins
   b) Single reins
   c) Double reins (with certain bits)
   d) Multiple reins (for teams of horses)

5. It is important to have proper equipment when caring for horses; every horse owner should have some basic equipment. Have students relate back to the field trip, if taken, to create a list of necessary equipment. Discuss costs and importance of these items.

   What are some different types of equipment and their uses?

   a) Feeding
      1) In containers
      2) On the ground (not recommended because of parasites)
   b) Grooming
   c) First aid (scissors, gauze, vet wrap, rolled cotton, antiseptic, crepe bandage, vet thermometer, alcohol, iodine, a clean bucket, and twitch)
   d) Transportation

6. Owning a horse is not an inexpensive venture. The type of equipment and facilities chosen will have a large impact on cost. Have students break into smaller groups. Instruct each group to develop a plan to start their own horse farm. Each group must decide if they are going to raise for profit or if they are just going to keep horses for pleasure. In either case, they should include in their report all costs involving types of equipment, facilities, feed, and livestock needed.

   How does the type of equipment and facility affect cost?

   a) Fencing (safety)
   b) Feeding

c) Watering
d) Shelter
e) Upkeep
f) Travel vs. stationary
g) Familiarization and use of new equipment before buying it

F. Other activities

1. Take a field trip to a local equine supply dealer, and have students observe facilities and equipment used and available.

2. Show the video, *Basic Horse Care* (80 minutes, AG video 182), available from the Missouri Vocational Resource Center.

3. Visit a farm or ranch where horses are raised, and have students observe how the operation is set up and operated.

G. Conclusion

Equine equipment and facilities vary a great deal. It is important to understand the different types and uses of equipment, along with the costs involved in owning a horse.

H. Competency

Identify proper tack, equipment, and facilities for horses.

I. Answers to Assignment Sheet 8.1

1. a
2. h
3. d
4. b
5. c
6. g
7. f
8. k
9. d
10. h
11. j
12. b
13. i
14. c
15. e
16. g

J. Answers to Evaluation

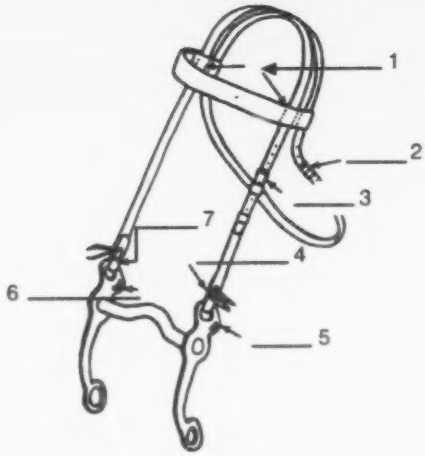
1. b
2. c
3. a
4. d
5. c
6. d
7. b
8. c
9. b
10. a
11. c
12. a
13. Answers will vary, but should indicate that the trailer soundness, the number of horses being hauled, and amount of travel done are important factors.
14. Five of the following: scissors, gauze, vet wrap, rolled cotton, antiseptic, crepe bandage, vet thermometer, alcohol, iodine, a clean bucket, and twitch

UNIT - EQUINE SCIENCE AS 8.1

Lesson 8: Equipment and Facilities Name ____________________

Identifying Tack Parts

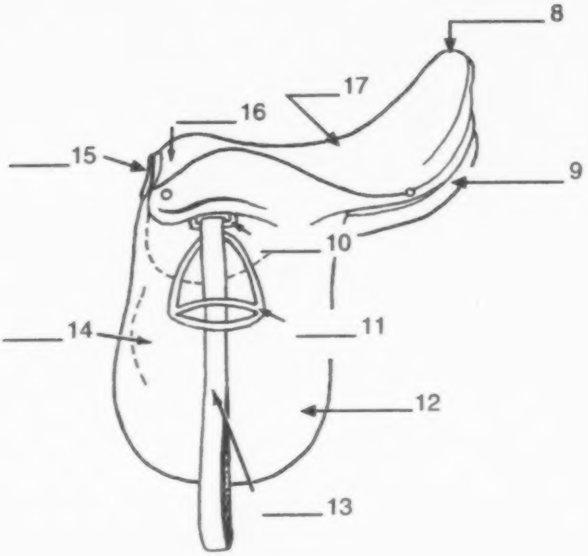
Match the bridle parts on the right with the illustration on the left.



a. Browband
b. Left curb bit attachment
c. Left curb chain hook
d. Left curb headstall cheekpiece
e. Right bridoon cheekpiece
f. Right curb bit attachment
g. Right curb chain hook
h. Throatlatch

Credit: *Choosing, Assembling, and Using Bridles (G2845)*

Match the saddle parts on the right with the illustration on the left.



a. Cantle
b. Flap
c. Knee pad or knee roll
d. Panel
e. Pommel
f. Seat
g. Skirt
h. Stirrup bar
i. Stirrup leather
j. Tread or stirrup iron

Credit: ***Equine Management and Production*** © 1994, Curriculum and Instructional Materials Center, Oklahoma Department of Vo-Tech. Used with permission.

UNIT - EQUINE SCIENCE Name ____________________

Lesson 8: Equipment and Facilities Date ____________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. Which describes the halter and bridle?

   a. Communicate directions to the rider
   b. Communicate cues to the horse
   c. Have no real use
   d. Made only of leather

2. What is the main difference between a bridle and halter?

   a. Appearance only
   b. Materials used to make them
   c. Bridles have bits.
   d. Halters have bits.

3. What are two main styles of tack?

   a. Western and English
   b. Western and European
   c. European and English
   d. English and Australian

4. What is the main difference between Western and English saddles?

   a. None
   b. In name only
   c. Materials used to make them
   d. High pommel and cantle (Western)

5. When the throat latch is adjusted properly, how much space should be between it and the horse's jaw?

   a. One finger's space
   b. One to two fingers' space
   c. Two or three fingers' space
   d. Four or five fingers' space

6. How should the gullet of the saddle rest?

   a. Behind the withers
   b. Above and resting on the withers
   c. In front of the withers
   d. Above the withers without rubbing them

7. On which of the horse's pressure points do bits act?

   a. Neck
   b. Head
   c. Withers
   d. Chest

8. Which describes a small-diameter bit?

   a. Softer on the horse's mouth
   b. Harder to use
   c. Harsher on the horse's mouth
   d. Longer lasting

9. How many basic types of reins are there?

   a. One
   b. Two
   c. Three
   d. Four

10. Which is a poor feeding place?

   a. On the ground
   b. In a five-gallon bucket
   c. In a variety of containers
   d. In commercial containers

11. Which is a poor watering container?

   a. Five-gallon bucket
   b. Commercial waterer
   c. One-gallon bucket
   d. Stock tank

12. What is most important when purchasing new equipment?

   a. Knowing how the equipment works
   b. Buying it as soon as it is available
   c. Waiting a year
   d. Renting it first

Complete the following short answer questions.

13. What three factors are important when considering a trailer purchase?

   a.

   b.

   c.

14. List five things that a first aid kit should contain.

a.

b.

c.

d.

e.

UNIT - EQUINE SCIENCE

Lesson 9: Handling Horses

Objective: The student will become familiar with the proper methods of handling a horse, including how to lead, lunge, mount and dismount, and safely trailer a horse.

Study Questions:

1. **What are the proper methods of leading a horse?**
2. **What is lunging and when is it used?**
3. **What are the proper methods of mounting and dismounting?**
4. **What are the different styles of equitations?**
5. **How are various restraints used?**
6. **How is a horse properly haltered?**
7. **How is a horse groomed?**
8. **What are some safety precautions for trailering?**
9. **What are the federal and state regulations dealing with horses?**

References:

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
    - a) G2881: Saddling, Bridling and Riding the Western Horse
    - b) G2844: Haltering and Tying Horses

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UNIT - EQUINE SCIENCE

Lesson 9: Handling Horses

TEACHING PROCEDURES

A. Review

Review key points from Lesson 8.

B. Motivation

Invite a local saddle club representative, breed association representative, or other local equine expert to discuss horse handling with the class.

C. Assignment

D. Supervised study

E. Discussion

1. Properly leading a horse is an important safety issue. If the handler does not lead the horse in a safe and secure manner, injuries can result to the handler and/or the horse.

   What is the proper method of leading a horse?

   a) Walking to the horse's left
   b) Lead ropes
   c) Length of rope
   d) Holding the rope (in right hand with excess coiled in left hand)
   e) Tying a lead rope

2. Lunging is a method of training and exercise for both the unbroken horse and the trained horse. It provides exercise to help in muscle development, as well as providing an excellent training method.

   What is lunging and when is it used?

   a) Space required
   b) Reasons for lunging a horse
   c) Working the horse in both directions

3. Mounting and dismounting a horse is simple, but it is important to do it in a safe manner. Make sure the equipment is in good condition. A worn girth or stirrup can break and cause injury to the rider and/or horse.

   What are the proper methods of mounting and dismounting?

   a) Checking equipment first
   b) Mounting on the left side
   c) Dismounting by reversing mounting procedure

4. The wonderful thing about equitation (process of riding) is that there are different styles, such as Western and English.

   What are the different styles of equitation?

   a) Western
   b) English

5. Sometimes it becomes necessary to restrain the horse in order to provide some sort of treatment. This is accomplished in different ways, depending on the reason for the restraint and on how well the horse responds to restraints.

   When are various restraints used?

   a) Using a halter and lead rope
   b) Gripping the neck
   c) Twisting an ear
   d) Twitch (device attached to upper lip)
   e) Sideline
   f) Hobbles

6. Always approach a horse from the side or at an angle. Never approach it straight on or from the rear because it can't see well in those areas. Use equipment that is in good shape and fits properly. Approach with caution, and in general, make the horse aware of your approach.

   How is a horse properly haltered?

   a) Confidence
   b) Proper angle
   c) Proper equipment
   d) Halters in the pasture

7. Part of properly caring for and handling a horse is grooming. The frequency of grooming depends on the how often the horse is ridden, the environment, and whether or not the horse is stabled. Grooming helps maintain the horse's health, keeps parasites controlled, and helps teach the horse manners.

   How is a horse groomed?

   a) Grooming
   b) Clipping hair
   c) Braiding mane and tail
   d) Washing
   e) Blanketing
   f) Daily grooming vs. for show
   g) Health care
      1) Picking out hooves
      2) Checking for injuries

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8. There are safeguards that should be taken into consideration when handling a horse. One of these precautions involves trailering the horse to move it long distances safely and quickly.

   What are some safety precautions for trailering?

   a) Leg wraps
   b) Trailer (equipment) safety
   c) Loading
   d) Unloading

9. Owning a horse is a big responsibility. Not only must an individual know how to care for a horse, but he/she must be aware of local, state, or federal laws governing horse ownership.

   What are the local, state, and federal regulations dealing with horses?

   a) Blood tests (Coggins)
   b) Liability
   c) Health checkup

F. Other activities

1. Go to a local training facility and observe their training methods.

2. Go to a horse show and watch how exhibitors handle horses during different events.

3. Invite a local trailer dealer to point out safety innovations and different styles of trailers.

G. Conclusion

Safety is the most important part of handling a horse. Improper handling can result in injury to the handler, the horse, or both.

H. Competency

Identify basic techniques of handling horses.

I. Answers to Evaluation

1. b
2. a
3. d
4. c
5. b
6. b
7. a
8. d
9. a
10. d
11. d
12. b
13. c
14. a

UNIT - EQUINE SCIENCE Name ____________________

Lesson 9: Handling Horses Date ____________________

EVALUATION

Circle the letter that corresponds to the best answer.

1. Where should the handler walk when leading a horse?

   a. To the horse's right
   b. To the horse's left
   c. Ahead of the horse
   d. Behind the horse

2. When leading a horse, how should the lead rope be held?

   a. In the right hand with the excess in the left hand
   b. In the left hand with the excess in the right hand
   c. In the left hand with the excess falling to the ground
   d. In the right hand with the excess falling to the ground

3. What is lunging?

   a. When the horse suddenly jumps forward
   b. When the horse suddenly jumps to the side
   c. When the horse suddenly jumps to the rear
   d. A method of exercise and training

4. When or how should a horse be lunged?

   a. In the morning
   b. In the cool of the evening
   c. In both directions
   d. In only one direction

5. How is dismounting done?

   a. As quickly as possible
   b. By reversing the mounting process
   c. As slowly as possible
   d. From the rear

6. What is equitation?

   a. The art of saddle making
   b. The process of riding
   c. Done only in English style riding
   d. Done only in Western riding

7. Why are restraints used?

   a. As a method of control
   b. Only in emergencies
   c. As often as possible
   d. As a method of punishment

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8. What is a twitch?

a. Nervous reaction of the horse
b. Nervous reaction of the rider
c. Part of the saddle
d. Mechanical device used as a restraint

9. How should a horse be approached when trying to halter it?

a. From the side
b. From the rear
c. From the front
d. Very quietly

10. What does grooming do for the horse?

a. Helps maintain its health
b. Cuts down on parasites
c. Teaches it horse manners
d. All of the above

11. What is important to do when grooming a horse?

a. Pick out the hooves.
b. Check horse for injuries.
c. Spray for flies.
d. All of the above

12. Which is a safety precaution to remember when trailering a horse?

a. Take along some lunch.
b. Check the trailer before leaving.
c. Have a strong bridle and reins.
d. None of the above

13. Which applies to in-state travel with a horse?

a. There are no regulations to worry about.
b. No one can keep you from competing at the local level.
c. There can be local regulations on health and safety.
d. There are some regulations, but no one checks them.

14. Which applies to out-of-state travel with horses?

a. Check on applicable state regulations.
b. Another state's regulations don't apply.
c. There are no state regulations concerning horses.
d. There are different state regulations, but no one ever checks.

UNIT - EQUINE SCIENCE

Lesson 10: Career Opportunities

Objective: The student will learn that the equine industry has many career opportunities.

Study Questions

1. **What career opportunities are available?**
2. **When might a supporting income be needed?**
3. **What are some emerging technologies?**
4. **What are some different marketing options?**

References:

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.

UNIT - EQUINE SCIENCE

Lesson 10: Career Opportunities

TEACHING PROCEDURES

A. Review

Review Lesson 9.

B. Motivation

Ask students to name as many different occupations involving horses as they can. List these on the board.

C. Assignment

D. Supervised study

E. Discussion

1. There are two types of careers available in the horse industry: primary and secondary careers. There are also a large number of careers in which a person works indirectly with horses.

   What career opportunities are available?

   a) Primary careers deal with horses directly.
   b) Secondary careers work with horses indirectly.
   c) Experience is especially important in primary careers.

2. Owning a horse is expensive. Many people own horses as a hobby and do not make enough money from them to pay expenses. Others might earn part of their income from breeding, stabling, or training horses, but income is often needed from other sources, as well.

   When might a supporting income be needed?

   a) Horse ownership as a hobby
   b) To maintain desired standard of living

3. In today's society, technology continues to increase at a rapid pace, which provides new ways to care for horses.

   What are some emerging technologies?

   a) Medical care
   b) Breeding
   c) Training

4. There are several ways to market horses. Knowing the various ways is important in order to make the most profit.

What are some different marketing options?

a) As breeding stock
b) As yearlings
c) To European and Asian markets

F. Other activities

1. Show the video, *Unbridled Opportunities* (24 minutes, AG video 214), available from the Missouri Vocational Resource Center.

2. Visit a horse auction, training facility, equine hospital, or other business that deals with horses.

G. Conclusion

The equine industry offers many career opportunities, ranging from assistant trainers to veterinarians. If a person is interested in a career in the horse industry, he or she should learn as much about that area as possible by talking to professionals and equine organizations.

H. Competency

Examine career opportunities.

I. Answers to Evaluation

1. Primary and secondary

2. Answers will vary but could include the following: veterinarian, jockey, farrier, auctioneer, equine sales representative, equipment builder, breeder.

3. A supporting career is a business venture that provides additional income to pay for equine expenses.

4. Answers will vary but could include the following: medical treatment, artificial insemination, equine swimming pools

5. Answers will vary but could include the following: selling breeding stock, selling yearlings, or selling meat to European and Asian markets.

UNIT - EQUINE SCIENCE

Lesson 10: Career Opportunities

Name ______________________________

Date ______________________________

EVALUATION

Complete the following short answer questions.

1. What are the two types of career opportunities?

   a.

   b.

2. List four different equine careers.

   a.

   b.

   c.

   d.

3. What is a supporting career?

4. What are two new technologies?

   a.

   b.

5. What are two marketing options for a horse breeder?

   a.

   b.

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10-4610-S
Student

Equine Science

In cooperation with Agricultural Education, Department of Practical Arts and Vocational-Technical Education, College of Education and College of Agriculture, Food and Natural Resources, University of Missouri-Columbia.
In cooperation with Agricultural Education Section, Division of Vocational and Adult Education, Department of Elementary and Secondary Education, Jefferson City, Missouri.

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FOREWORD

Development of *Equine Science* is the result of MVATA Teaching Aids Committee suggestions. The unit was developed to enhance the Agricultural Science I course for grade 9.

This student reference contain 10 lessons: Introduction, Psychology and Handling, Conformation and Selection, Genetics and Reproduction, Herd Health, Hoof Care, Nutrition, Equipment and Facilities, Handling Horses, and Career Opportunities. Additional student reference copies can be purchased separately.

Persons using this reference on an individual basis may wish to purchase the instructor guide, which contains additional reference materials.

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Lesson 1:
Introduction

Fossil remains of the horse family have been found on the Great Plains. These fossils date back to approximately 58 million years ago. When Columbus came to America, the horse had vanished. There are several theories about why the horse vanished, but the exact reason is still unknown. Horses of prehistoric times were quite small—only about a foot in height—as compared to today's horse that can be more than 18 hands. (A hand is equal to 4".) Unlike the modern horse of today, the first horse, eohippus, had four functional toes and one nonfunctional toe on the front feet. On the hind feet, there were only three functional toes and one nonfunctional toe.

Influence of the Horse Throughout History

In prehistoric times, the horse was sought after as a food source. The first to domesticate the horse is thought to have been a group of nomads who roamed the central plains of Asia. The Scythians used the horse as a food source and to wage war on their enemies. It is thought that the Chinese were the first to keep horses in herds for power and transportation.

During the great migration west in the U.S., thousands of people depended on the horse to transport them. Many times, their very survival depended on the horse. The horse was and still is a companion animal, as well. For the American Indians, the reintroduction of the horse meant great changes in their lives. The Indians quickly discovered that horses were a great partner for hunting and in war, and they soon became very skilled in working with horses.

As mentioned earlier, horses were very important in the great migration west. Wagons containing everything the travelers owned were pulled through mountain passes, across rivers and streams, and across deserts. The horse was a vital part of making our country what it is today.

Return of the Horse to the Americas

Horses have populated the earth almost since the beginning of time, but they had vanished from the North American continent. It wasn't until the late 1400s that explorers such as the Spanish Conquistadors reintroduced them to North America. Columbus first brought horses with him to the West Indies in 1493, while Cortez brought horses from Spain to Mexico in 1519. The Spanish explorer, de Soto, was the first to bring horses to what is now the United States when he traveled from the Florida Everglades to the Missouri Ozarks. Missionaries also brought horses into the U.S. as they traveled to set up missions with the various Indian tribes.

Changing Roles for the Horse

The horse played an important role in early American development. Thousands of people traveled west by horse-drawn and mule-drawn wagons. The horse's use and popularity steadily increased until the early 1920s. In 1908, Henry

Table 1.1 - Horses on Farms

Year	In Missouri	In U.S.
1890	946,401	15,266,244
1900	908,860	18,267,020
1910	1,035,884	19,833,113
1920	906,220	19,767,161
1925	708,122	16,400,623
1930	597,090	13,510,839
1935	523,648	11,857,850
1940	505,073	10,086,971
1945	476,187	8,499,204
1950	326,473	5,409,417
1954	129,495	2,962,220

Horses and Ponies on Farms

Year	In Missouri	In U.S.
1974	58,712	1,595,640
1978	73,283	1,957,028
1982	76,977	2,260,791
1987	79,436	2,456,951
1992	64,628	2,049,522

Source: *1992 Census of Agriculture*, U.S. Department of Commerce, Bureau of the Census.

Ford started making automobiles that were economical to produce and affordable to drive. Soon after, trucks and tractors started to replace the horse. The numbers of horses stopped declining in the early 1960s, and they have increased steadily since then. (See Table 1.1)

Today, the popularity of the horse has made a strong comeback, mostly as a source of recreation. In addition, some people still use the horse as a power source to pull wagons and plows or to herd cattle.

Horse Classification

Horses are classified by size, build, and weight into three types: ponies, light horses, and draft horses. Ponies are less than 14 hands tall and weigh 500-900 pounds. They are often used to pull small carts. Light horses stand 14-17 hands high, weigh 900-1,400 pounds, and are used for riding, driving, racing, or as general-purpose farm workers. The draft horse stands 14-17+ hands and weighs at least 1,400 pounds. Draft horses are much stockier and are used primarily to pull heavy loads.

Table 1.2 shows the annual registration and total registration for the various breeds of light horses.

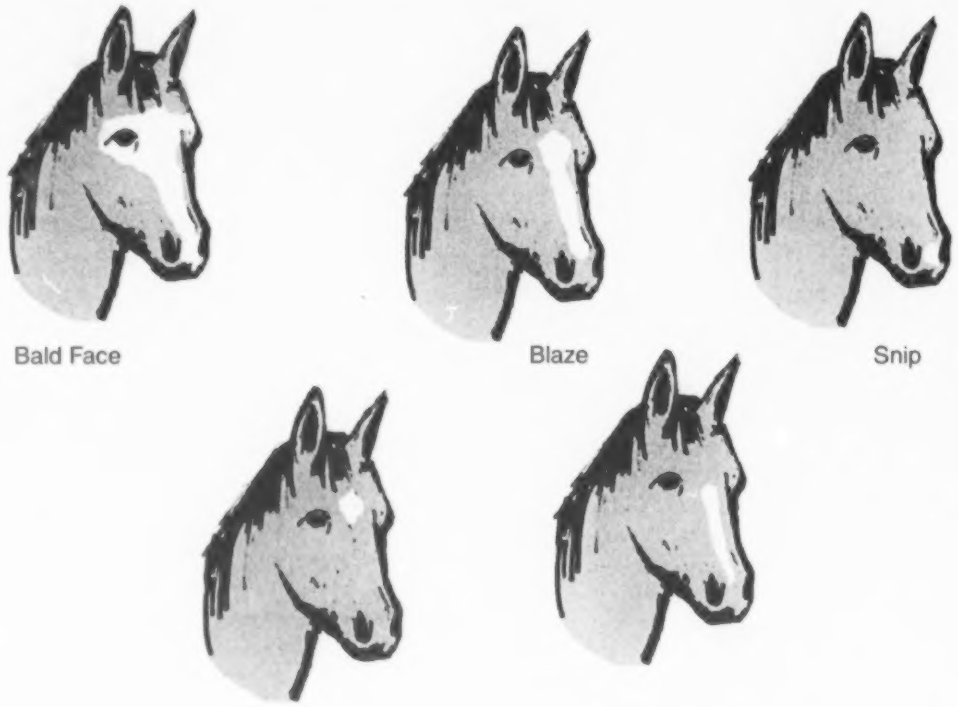
Color - Colors vary a great deal, and certain breeds have special coloring characteristics. Common coat colors in horses are black, brown, bay, and chestnut. From these four, all other combinations are derived, such as white, grey, cream, dun, roan, and pied.

Table 1.2 - Various Breed Registrations (1988-1993)

Breed	1988	1989	1990	1991	1992	1993
Anglo and Half Arab	6,500	4,775	4,276	4,251	3,834	3,668
Appaloosa	12,317	10,746	10,669	9,902	10,033	9,079
Arabian	24,569	21,723	17,676	12,993	12,544	12,349
Hackney	866	779	809	731	464	701
Miniature Horses	3,986	4,636	5,760	5,278	6,500	6,500
Missouri Fox Trotting Horse	1,649	1,737	1,769	1,867	2,250	2,821
Morgan Horse	3,526	3,732	3,618	3,392	2,408	3,120
National Show Horse	978	919	733	624	557	473
Paint	14,929	14,390	16,153	18,648	22,396	24,220
Palomino	1,747	2,080	1,598	1,564	1,358	1,671
Paso Fino	1,464	1,453	1,550	1,483	1,859	1,640
Quarter Horse	128,352	123,294	110,597	101,390	102,843	104,876
Racking Horse	4,475	3,500	4,500	4,500	4,500	4,500
Saddlebred	3,811	3,708	3,569	3,570	3,048	3,353
Standardbred	17,393	16,896	16,576	13,617	13,029	12,086
Tennessee Walker	8,983	8,850	7,972	7,852	8,123	7,510
Thoroughbred	49,219	48,218	43,571	37,442	37,915	35,405
Total	**283,115**	**269,699**	**249,627**	**227,237**	**231,411**	**231,151**

Source: *1995 Horse Industry Directory*. Washington, DC: American Horse Council, Inc., 1995, p. 20.

Figure 1.1 - Face Markings



Bald Face

Blaze

Snip

Star

Stripe

Chestnuts range from light golden-red to a very dark red that is often called a liver chestnut. Bays can be described as chestnuts with black points (mane, tail, and legs). Browns have brown bodies and very dark manes, tails, and legs. Black horses are black all over. White horses are white all over and may have blue eyes. Most white horses are born grey and become whiter with age. Greys are usually one of the common colors at birth and turn grey with age. A roan horse is a combination of the four common colors, resulting in black (blue) roans, bay (red) roans, brown roans, and chestnut (strawberry) roans. A dun horse is a bay with a dark stripe down its back and can have dark stripes on the knees or hocks. The body of cream-colored horses is cream colored, while a Palomino is a cream-colored horse that ranges from light to dark golden with cream mane and tail. Pied horses have large white areas that alternate with one of the four common colors, such as pied black, pied brown, pied chestnut, or pied bay. See a chart of breeds and coloring for further identification.

Markings - Along with coat coloring, horses have face and leg markings. (See Figure 1.1.) On the face, these markings are stars, stripes, snips, lips, blazes, and bald faces. The star is a star-shaped area of white hair that is located on the forehead. A stripe is a band of white that runs down the face to the nostrils. A white marking on the nose's end only is a snip. A lip is a white mark on the upper lip that can run down to the lower lip. A blaze is a wide stripe that runs from the star, past the nostrils, to the end of the nose; a blaze is the width of the top of the nose. A bald face is a blaze that goes over the nose's edge and frequently includes the eyes.

Leg markings include coronet, pastern, fetlock, cannon, and knee or hock. (See Figure 1.2.) The coronet is a stripe of white hair just above the coronet is a stripe of white hair just above the coronet band. Pastern is from the coronet to just below the fetlock. The fetlock is white from the coronet to the top of the fetlock joint. Cannon marking is from the coronet to just below the knee on the front leg. Knee or hock markings are in the region from the coronet to the knee or hock.

Light horse breeds - Each breed has characteristics that make it unique. Some of the more popular breeds and their characteristics follow.

The Saddlebred originated in the U.S. Saddlebreds are either three-gaited or five-gaited and used primarily as pleasure horses. (Gait describes the way a horse moves, such as walking, trotting and galloping.) The Saddlebreds are noted for their easy ride and head movement as they walk. They have an attractive head set on a long neck; short, rounded back; level croup; and high tail setting. They are very flashy but usually docile and intelligent.

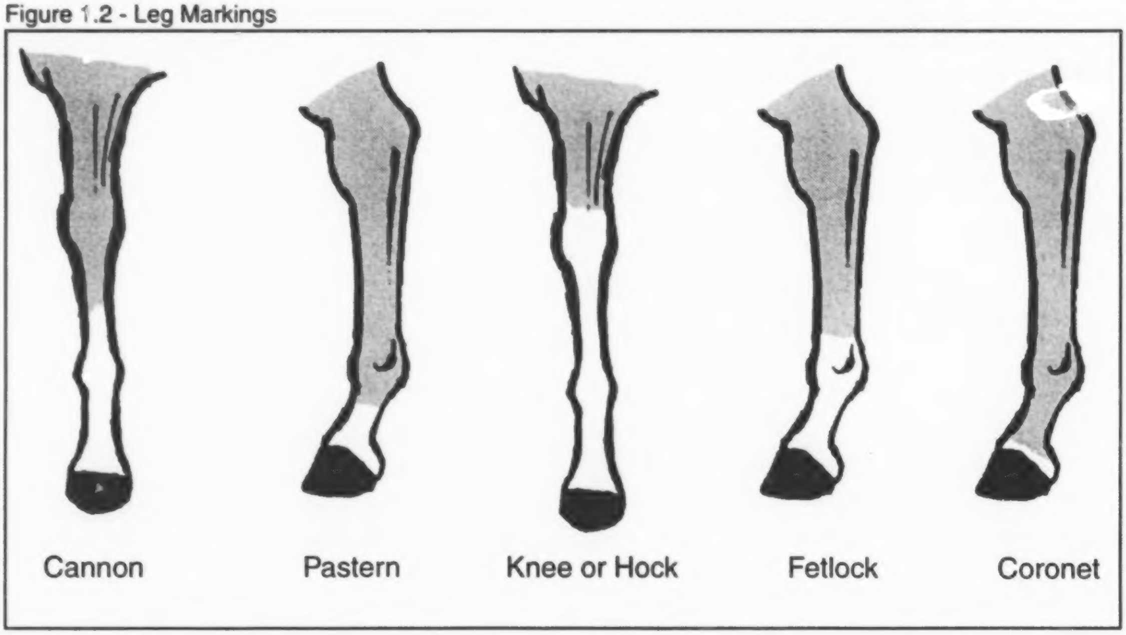
Appaloosas also originated in the U.S. and are noted for their unusual coat coloring. They have many variations of spotting and can be any combination of colors. All have a white circle around the eye and vertical striping of the hooves. They have been used for war, racing, and buffalo hunting; they played a major role in the development of the early-day livestock industry. Today, they are primarily used as a pleasure horse.

Arabians are credited as the foundation of all light-horse breeds. They are noted for having beautiful tapered heads with dished faces; short, alert ears; large, wide-set eyes; large nostrils; and deep, wide jaws. Originating in Arabia, they are primarily saddle horses, but are also used as stock, racing, and pleasure horses.

Another American horse is the quarter horse. They were the earliest U.S. race horse. Quarter horses are noted for their heavy, well-defined muscling; large heads with large, prominent jaws; small, alert ears; well-developed necks; and short, heavily muscled backs. They were developed for racing and ranching. They are fast and very agile with athletic abilities that are unsurpassed.

The Missouri Fox Trotter is a breed that originated in the hills of the Ozarks around Ava, Mo. It is noted for its sure-footed, easy gait and very smooth ride. The breed registry was established in 1948 and is located in Ava. With its smooth ride, poise, and easy manner, the Fox Trotter quickly became known as the common person's pleasure horse.

Figure 1.2 - Leg Markings



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Draft horses and ponies - Originating in Europe, draft horses are known for their massive bulk, great strength, and gentle manner. They are used primarily to pull great weight and are still used in some areas to pull plows and wagons.

Most ponies, with the exception of the Pony of the Americas, were developed in Europe. They are small and used as children's horses and to pull small carts.

Summary

The horse has had a large impact on people's lives throughout history and will probably continue to grow in popularity. Horses come in many shapes, sizes, colors, and uses. People today enjoy horses in a variety of activities; their love and fascination of the horse will undoubtedly continue.

Credits

Hawcroft, Tim. *The Complete Book of Horse Care.* New York: Howell Book House, Inc., 1994.

Ensminger, M. Eugene. *Horses and Horsemanship.* 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Lesson 2:
Psychology and Handling

Horses are much stronger than people, so it is much better to get a horse to do something because it *wants* to do it. Generally, one person cannot force a horse to do something it does not want to do. This makes it important to understand how horses think and how they will act under certain circumstances.

When working with any horse, it is important to reinforce actions that are desirable with praise. When undesirable actions happen, they should immediately be met with some sort of punishment. Using positive and negative reinforcement is an important part of any horse's training.

Reaction to People

Like people, horses have their own personalities. Some are very jumpy, easily spooked, or aggressive, while others are calm and docile. Some horses show a great deal of loyalty and affection to their owners, while others are very independent.

Signs of Danger

When the horse appears nervous or agitated, there's something wrong. Observing these signs will help a handler avoid injury. A horse's handler should be aware of danger signs and react accordingly. One of the best indicators is the horse's ears because they show which way the horse is looking. (See Figure 2.1.)

If the ears and eyes are relaxed with the ears dropped back, the horse is resting or asleep. If both ears are perked up and forward, it is interested in something. A horse can look and listen in two directions at once. If one ear points forward while the other is pointing to the rear, the horse is watching both directions. When a horse pins its ears back, it is angry and there is a danger of being kicked.

How a horse holds its tail can also communicate. If the horse switches its tail, something is bothering it—flies or something the rider is doing.

Pawing the ground is another sign that a horse is not pleased. This can mean that it doesn't like something, or it might be because the horse has been tied up and is bored. Whatever the signs, the handler should get to know the animal and never ignore what it is trying to "say" so that an injury can be prevented.

Horse Manners

As mentioned earlier, each horse has its own personality and can develop good or bad manners. There are several bad manners (vices) that horses sometimes pick up; some of them can affect the horse's health.

Barn sour - With this vice, the horse doesn't want to leave the barn. This can be the result of not wanting to leave a companion or the safety of the barn. A preventive measure is to work the horse after returning to the barn area.

Biting - Biting can be caused by innocently giving the horse treats or by rubbing its nose while petting.

Bolting feed - It is not known for certain why some horses gulp (or bolt) their food, but they can be slowed down by spreading the food out or placing a large, baseball-sized rock in the feed.

Cribbing - This is when a horse hooks its upper teeth on a solid object, extends its neck, and sucks in air. This bad habit can cause bloating, and horses that crib often are more prone to get colic.

Pawing - Here, a horse stands and digs at the ground with its front feet. Many times, this is a sign of boredom and releasing them into a paddock or field will help prevent it. Occasionslly, pawing the ground means the horse is sick.

Shying - Some horses seem to be easily spooked by unfamiliar items. The only things that can be done are to develop trust and use good training methods and patience.

Weaving, stall walking, and wood chewing - These vices are usually brought on by boredom and can be corrected by allowing the horse to get outside and exercise.

Equine Senses

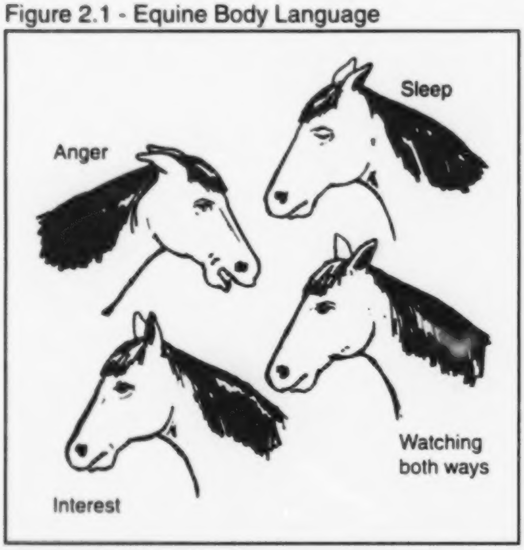
The horse has monocular vision, which gives it the ability to use each eye independently and see different pictures at the same time. When a horse wants a good look at something, it looks straight at it and uses both eyes in a binocular manner. The horse does have two blind spots--directly in front of its nose and directly in back of the horse. This is why a horse should *always* be approached from the side or at an angle, never from the rear or from straight ahead. Horses have very good night vision. It is a good idea to talk to horses so they also hear you coming.

The horse is much better at detecting something approaching it than most animals. With its monocular vision and excellent hearing, it can watch a greater area than a cow or most other animals. This is why horse warriors always paid close attention to horse signs.

Foal Handling

The newborn foal should be worked with as soon as possible. Rubbing the foal's body with a towel or gunny sack (sacking) helps get it used to handling. Start the foal on a regular routine of a short lesson, such as putting on a halter, at about 1-2 weeks of age. After the foal is used to the halter, tie it to the stall near the mare and groom it, working with the legs and hoofs. Well-disciplined horses result from early training.

Figure 2.1 - Equine Body Language



Training Methods

Trainers have their own style of training; however, certain things should remain constant. When teaching a horse a new lesson, patience is a must. Repeating what the horse is to learn is a must. It might take several days, weeks, or even months of practice before the horse has learned it thoroughly. Positive reinforcement should always be used, either by verbal praise or by giving some kind of treat. Don't overdo the treats, however; give them only when deserved.

Discipline is a means of communicating to the horse that it is doing something wrong. It is not being mean, nor is it mistreatment--unless it becomes excessive or inflicts injury to the animal. Mistreatment will be avoided if one never punishes out of anger.

Discipline should always be prompt and never administered out of anger. The whip and spurs are the most common devices used to discipline a horse. If a horse fails to carry out a command and discipline has been given, promptly make the horse follow through with the original command and follow that by positive reinforcement.

Summary

Horses are like people in that each has its own personality and can form vices. Handlers should become well acquainted with their horses and know how each horse reacts to handling. Training the horse at an early age will help eliminate problems with temperament and result in an animal that is easy to work. Routine, frequent handling is the key to a steady horse. Training styles may differ, but the basics are the same--repetition, reinforcement, and discipline.

Credits

Fraser, A. *The Behavior of the Horse.* Melksham, U.K.: Redwood Press Ltd., 1992.

Hawcroft, Tim. *The Complete Book of Horse Care.* New York: Howell Book House, Inc., 1994.

Lesson 3:
Conformation and Selection

Selecting a horse is somewhat like buying a car. Everyone wants four good tires, no major flaws in the body, two working headlights, good air intake, a sound motor, and a solid exhaust. Of course, the emphasis placed on a particular characteristic can vary, depending on the owner's needs and skill level. A draft horse is not suitable for someone with limited means to feed it, for example, just as a large, high-strung horse is not appropriate for a child.

Characteristics of a Good Horse

In general, the horse should be healthy and of normal weight. There should be no outward signs of disease.

Gender - After the class and breed have been selected, gender is the next decision. There are five choices: mare, stallion, gelding, colt, or filly. A mare is the adult female and can be a good pleasure horse or can be used for breeding. The stallion is an adult male and can also be used either as a pleasure horse or for breeding. However, a stallion can be more difficult to work with and frequently will not be the best choice for a pleasure horse, especially for the beginner. A gelding is a male horse that has been castrated and cannot reproduce. Geldings make very good pleasure horses because they do not exhibit any of the aggressive breeding characteristics that a stallion will when around mares. Colts are young male horses, and fillies are young females that have not foaled.

Leg structure - The next category to consider when buying a car is the tires; with a horse, it is the legs. Leg structure is very important. The leg should be straight and well muscled. If the horse has any defects in leg structure, problems can develop with the pastern, knee, shoulder, or hip. These problems can make the horse unsound to ride.

When looking at the chest, the ideal front legs are shown by drawing a straight line, perpendicular to the ground, from the point of the shoulder to the tip of the hoof on each leg. The legs would be in two identical segments from hip joint to hoof. Toes should point forward.

From behind the horse, find ideal hind leg structure by drawing imaginary, perpendicular lines from the points of the hip to the ground behind the heels. The line makes two equal halves, as with the front legs.

The head and muscles - The horse should have adequate muscling for its breed and a well-shaped head. It should have large, wide-set eyes that are bright and alert. A horse that has small eyes is likely to have poor vision and be easily spooked. Large, wide nostrils permit proper air intake. If the horse has small nostrils, it might not be able to breathe properly when asked to run or work hard.

Teeth - Deformed or poor teeth can cause weight loss and poor conditioning. This can lead to other problems, such as colic, impacted bowels, or in extreme cases, even death.

The teeth are the best indication of a horse's age. This is because teeth develop at different ages and wear at a certain rate, which can be correlated to the horse's age. Foals develop temporary teeth at about 4 weeks of age, starting with the front incisors. By about 9 months of age, all of the temporary teeth are in. At about age 2, permanent teeth replace the temporary teeth, starting again with the front incisors and working around to the back. Temporary teeth are whiter, smaller, and cup-shaped, while permanent teeth are off-white and more rectangular in shape.

It takes about 4½ years for all the permanent teeth to come in. They will all have a black area on top of the teeth, which wears off with age. At age 7, if the horse has not had its teeth floated (filed), a spot known as the seven-year hook will develop on the inside incisor. By the time the horse is 8 years old, all the black has worn off, and at age 10, a groove will appear on the inside incisor. As a horse further ages, the teeth wear and slightly protrude.

Because of the wearing of the teeth, it becomes necessary to float the teeth (file them) to keep sharp edges from developing that would cut the gums and make eating difficult and painful.

Temperament

A horse should have a good temperament; it should not be jumpy or aggressive. Many times, temperament problems are associated with such characteristics as small eyes, poor eyesight, or some other structural problem. Remember, a horse with a poor temperament (bad attitude) can cause many hours of problems or even injuries.

Balance and Soundness

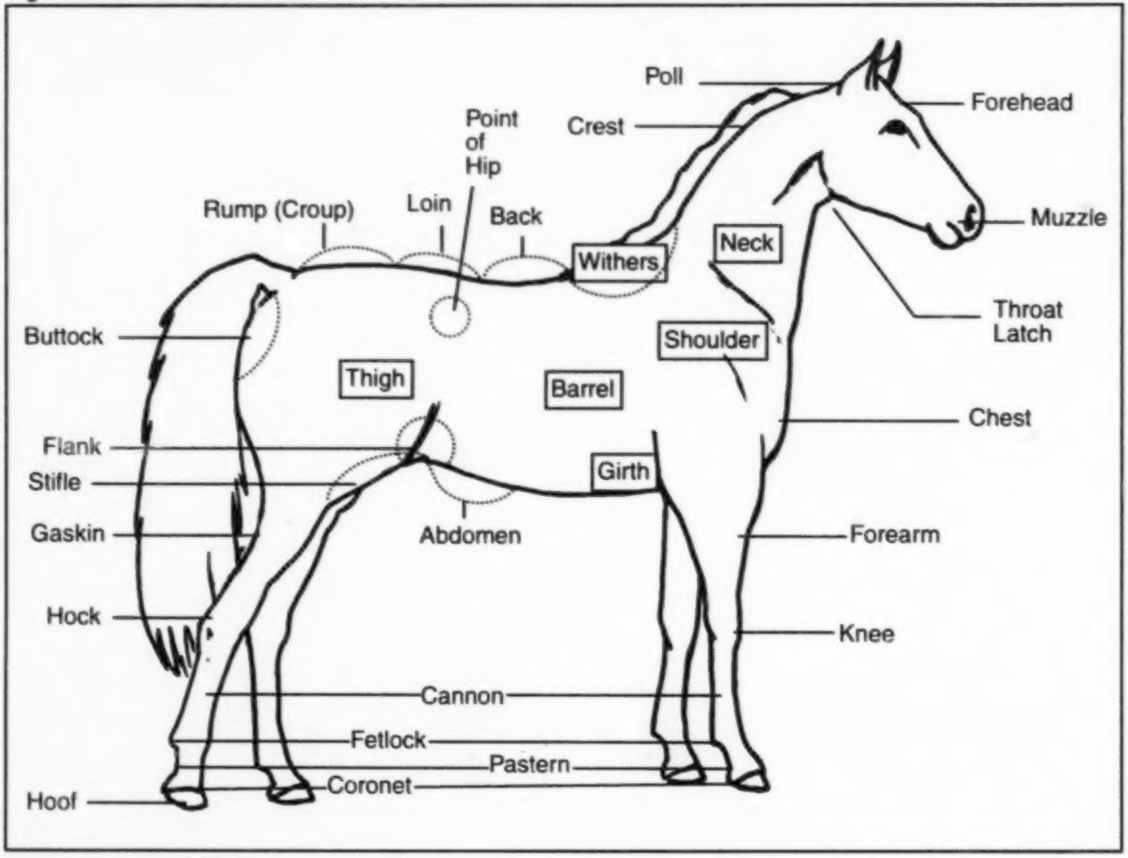
If possible, ask the veterinarian to look at the horse for internal problems or structural defects.

Balance - The horse should be properly proportioned. The head should not be too small for its frame, nor should the neck be too long. If the horse does not have a good balance to its body, it can be prone to stumbling. (See Figure 3.1 for parts of a horse.)

Soundness - Buying a horse that is unsound can cause problems in the future. The horse might appear to be all right, but as it ages, the defects can progress to the point that the horse will no longer be sound enough to ride. Some slight blemishes, however, might not cause any problems at all; they may be mere imperfections in appearance that do not interfere with performance.

In general, structure can be broken into two categories--blemishes and unsoundness. A blemish is something that does not interfere with the horse's performance. Anything that interferes with the horse's ability to perform makes it unsound. An unsoundness can be an inherited trait or it can be caused from some outside influence such as stress, strain, injury, or nutritional deficiency. Some minor defects, such as in travel or gait, can be corrected by shoeing.

Figure 3.1 - Parts of a Horse


Poll
Forehead
Point of Hip
Crest
Rump (Croup)
Loin
Back
Muzzle
Withers
Neck
Buttock
Shoulder
Throat Latch
Thigh
Barrel
Chest
Flank
Girth
Stifle
Gaskin
Abdomen
Forearm
Hock
Knee
Cannon
Fetlock
Pastern
Coronet
Hoof

Disreputable dealers can disguise defects. Always buy from a reputable owner who is willing to allow a veterinarian to examine the horse.

Performance Records and Pedigrees

Performance records - These records can be a great help when selecting a horse, especially if the horse will be used for breeding. Because of inherited genetic characteristics, the ancestors' performance can be a gauge of how well the offspring will do. The Thoroughbred breed registry was the first to use performance records. This registry recorded pedigrees of all horses that won important races, which is often recorded on the horse's registration papers.

Pedigree - A pedigree is simply a record of the horse's ancestry, which is often recorded on the horse's registration papers. It is much like a person's family tree. It is used to look back in time to find out which horses were bred to sire certain offspring. Pedigrees are used in conjunction with performance records to help predict how the offspring might be expected to perform.

Even more important than the horse's pedigree is the breeder's reputation. Look for breeders who will stand behind the quality of their animals.

Summary

To get a horse with desirable traits, attention must be given to the horse's conformation or makeup. Buying a horse is much like buying an automobile; if component parts are not well inspected, the buyer might end up with a lemon.

Credits

Ensminger, M. Eugene. *Horses and Horsemanship*. 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Hawcroft, Tim. *The Complete Book of Horse Care*. New York: Howell Book House, Inc., 1994.

University of Missouri-Columbia Extension Division agricultural publications

a) G2840: Unsoundness and Blemishes of Horses: Feet and Legs
b) G2842: Determining Age of Horses by Their Teeth
c) G2843: Leg Set: Its Effect on Action and Soundness of Horses

Lesson 4:
Genetics and Reproduction

Genetics determines the type of foal that will be produced. Understanding genetic influences will help a breeder select the highest quality animals possible for mating. Also, ensuring healthy births is critical to a productive operation since a horse's gestation period is 11 months long.

Genetic Characteristics

The characteristics that a breeder looks for in a horse, such as color, muscling, stamina, and speed, are somewhat breed specific. The field of study that explains this is genetics. Genetics deals with gene combinations and how genes are passed on from generation to generation (inheritance). With horses, it is somewhat difficult to advance genetic material because only one foal a year is produced.

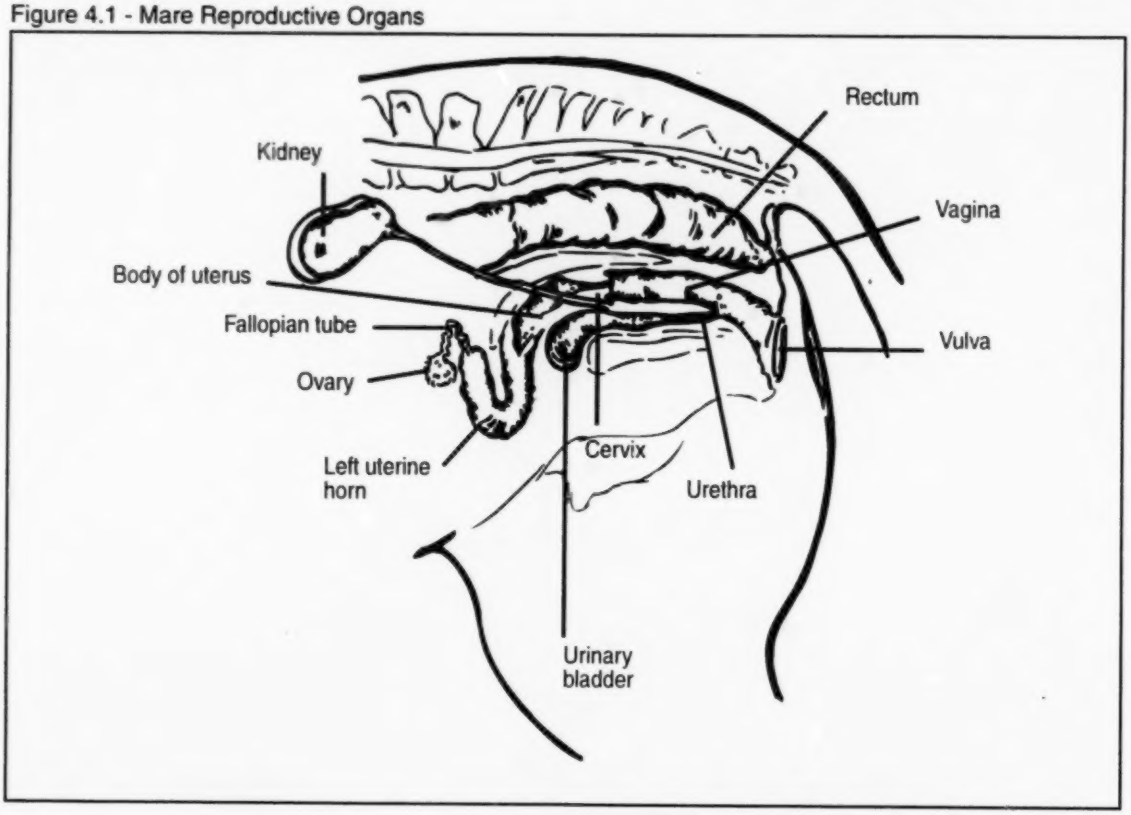
Breeders have been selecting for different characteristics for hundreds of years by breeding the best to the best. However, sometimes the foal is less desirable than the parents. The mare and stallion might have recessive genes that, when linked together, produce weak or lethal genes. This combination will cause severe defects and even death in foals. One lethal gene combination results in albinism, which causes the all-white foals to die, usually before birth.

The horse has a total of 32 chromosome pairs. When a mare is mated to a jack (the male of the ass family), it produces a mule. Mules are usually infertile because of the difference in parental chromosome numbers. This crossing of two different families produces a hybrid.

Reproductive Tract of the Mare

The reproductive tract of the mare is designed to produce the eggs (ova) and to provide a safe environment for the embryo to develop. After the

Figure 4.1 - Mare Reproductive Organs



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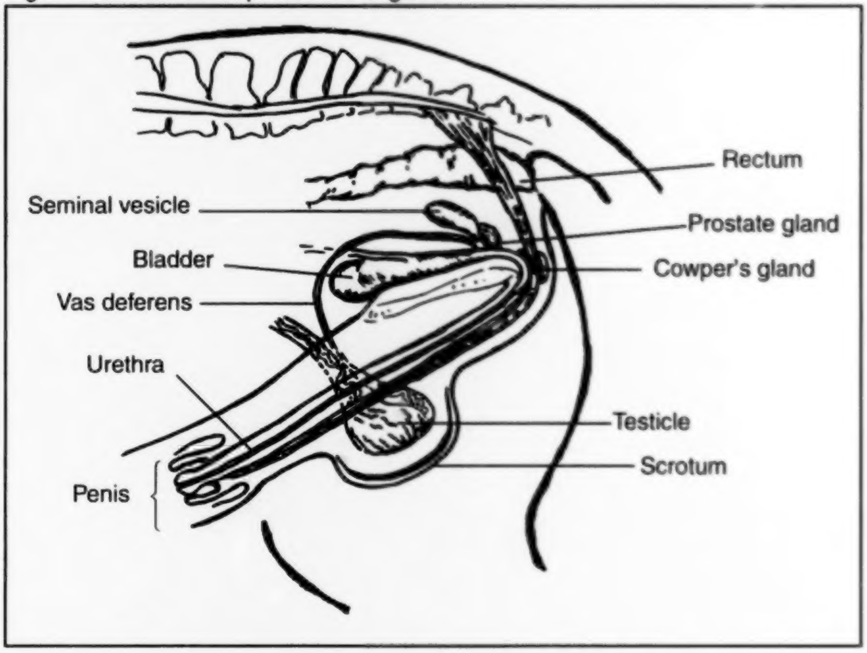
embryo has fully developed, the mare expels it to the outside world and provides it with nourishment until the foal has grown to sufficient size.

The ova (eggs) are produced in the ovary and are expelled from a blisterlike sac that forms on the outside of the ovary. Ova travel from the ovary to the fallopian tubes, which carry them down through the uterine horn to the uterus. (See Figure 4.1.)

After fertilization, the embryo attaches to the lining of the uterus by the umbilical cord. Before the embryo gets to the uterus, the uterus develops a thick lining of blood vessels. This lining supports the embryonic sac, which makes up the afterbirth. At the end of the uterus is a strong muscle called the cervix, which keeps foreign matter out of the uterus. The cervix leads to the vagina (birth canal), which is where semen is deposited by the male and, after gestation, where the newborn exits to the outside world.

The mare is receptive to the stallion only during parts of her estrous period. The breeding season varies from mare to mare, but on the average runs from mid-April to mid-October. The mare goes through a series of cycles that are about 21 days long. An ovum from the mare can become fertilized during a seven-day period in the middle of her 21-day estrous cycle. If the mare has not been bred successfully at that time, the cycle will repeat. In terms of handling, mares are frequently more temperamental during heat.

Figure 4.2 - Stallion Reproductive Organs



Reproductive Organs of the Stallion

The stallion's reproductive tract is designed to produce sperm cells and to transmit that sperm to the female's reproductive tract to fertilize the ovum. Sperm is produced in the testicles and is transmitted down a tube called the vas deferens. The vas deferens connects to the urethra just behind the bladder. The urethra acts as a common transportation tube for both urine and sperm cells. Along the urethra are three accessory glands: the seminal vesicles, the prostate gland, and the Cowper's gland. These glands produce fluids that help nourish the sperm and provide a transportation medium through the urethra in the penis. (See Figure 4.2.)

Methods of Reproduction

Nature needs no help to reproduce in the wild, but since domestication has changed the life of the horse, people have had to develop ways to assure that reproduction takes place at convenient times. In *natural (pasture) breeding*, the mare and stallion are allowed to run in the pasture and breed naturally. With this method, the breeder probably will not know when the mare is due to foal.

Many breeders want to know when the mare will foal, so the method of *hand breeding* is used. This method involves taking the mare to the stallion, which is tied to a rail, fence, or post. (See Figure 4.3.) When teasing the mare, the stallion is allowed to check the mare to see if she is in the appropriate part of the estrous cycle and will allow the stallion to service (breed) her. A mare that is not in estrous will aggressively kick and paw the stallion and not allow him to approach her. A mare that is in estrous will go through several gestures, such as winking. Winking is when she lowers her pelvis and raises her tail in a submissive manner, allowing the stallion to breed her.

Artificial insemination (AI) is not used very much in horse breeding because some breed registries will not register the foal if breeding is done in that manner. Another problem is that the semen does not freeze as well as it does in other animals, such as cattle. AI does have several advantages. One advantage is that it will allow one stallion to breed as many as 500 mares in one season, as compared to 80 in natural breeding or hand breeding.

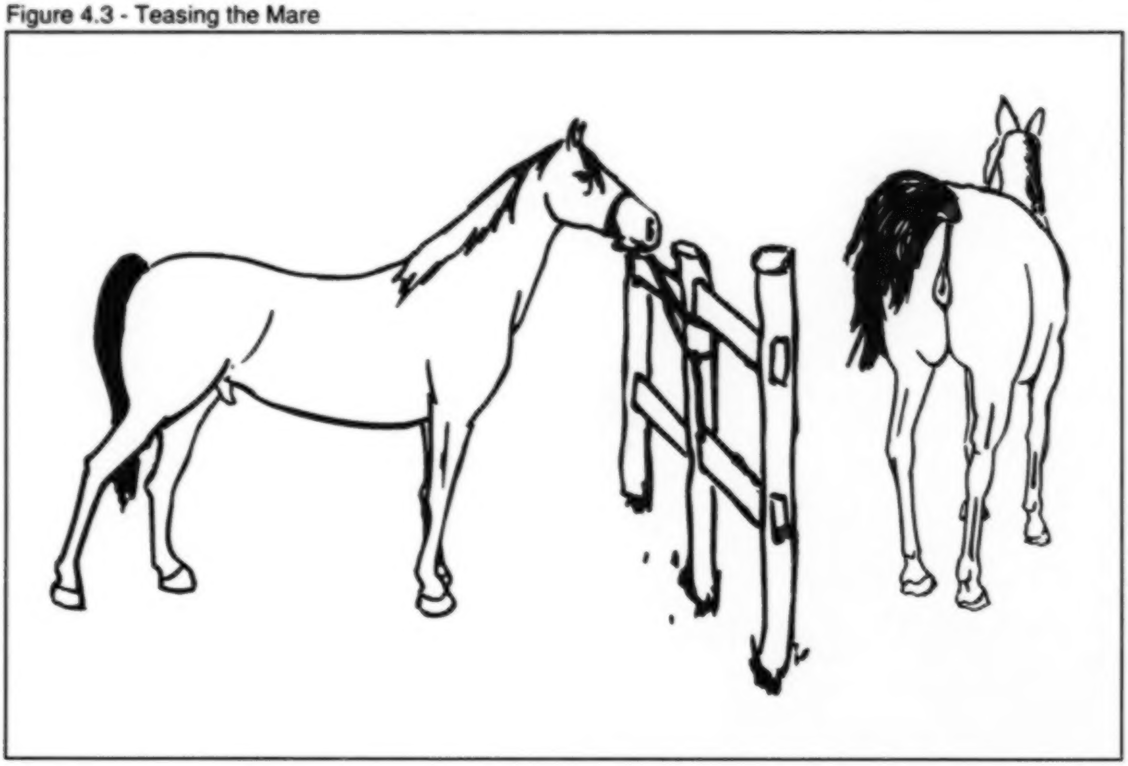
There are three steps to using AI. The first step is the collection of the semen. The next step is the evaluation of the semen. The last step in AI is insemination of the mare.

Parturition

Parturition is the process of giving birth. Waxing, the first sign that a mare is going to foal, takes place 2-4 days before foaling. The mare's teats secrete a waxy substance. However, not all mares do this. The next sign is when the mare's udder begins to get hard and full-looking. The mare's vagina muscles begin to relax, getting ready for the birth. The mare might also show signs of irritability and wish to stay in the quietest area.

During the actual birth, there are three stages. In the first stage, the mare might sweat, be agitated, paw the ground, or lie down and get up several times. She will not show signs of straining, but the water might break. During stage two, the mare will show visible signs of straining, and she will either lie on her side or sit. Fetal membranes will appear from the vagina as she strains. As she progresses, the foal's feet appear first, followed by the nose, which is the start of stage three. After the foal's head appears, the shoulders follow, and the rest of the birth is fairly rapid.

Figure 4.3 - Teasing the Mare



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After the foal has been delivered, the afterbirth will be expelled in 2-3 hours.

Dystocia

Dystocia refers to anytime a mare has difficulty giving birth to the foal. This can be caused by several things, such as the foal being too large for the birth canal, one or both of the legs being caught inside, the foal coming out rump first (breech), or if twins are present. Any time a mare strains or has contractions for longer than normal, a veterinarian should be called to assist.

Table 4.1 - Normal Delivery Stages

1.	Preparatory	30 min. to 4 hours
2.	Delivery	20-30 minutes
3.	Delivery of placenta	30 min. to 3 hours

Dystocia can be caused by many things, such as age, proportion of the mare to the foal, breech births, or a foal tangled in the umbilical cord. Other possible causes of dystocia can be disease or improper diet.

Afterbirth

It is important to check the afterbirth as soon as it has been expelled to make sure it all came out. (The placenta should be in the same basic shape as the foal.) If there are holes or unusual tears in the placenta, part of the placenta might have been retained in the uterus. Call a veterinarian to assist.

A retained placenta causes inflammation/infection of the uterus, which can trigger laminitis (founder). In foaling founder, the uterus becomes inflamed from some type of abrasion during parturition. This inflammation can also trigger founder (laminitis).

Colostrum

Colostrum is the first milk that the mare produces. It is thick and yellowish and contains antibodies that give the foal immunity against infections and diseases. Colostrum is higher in protein and antibodies than regular milk. The colostrum lasts only for a few days, and it is very important that the foal gets this first milk, as it is sometimes referred to, to help ward off disease or infection. As with other species, it is critical that the foal nurses within the first two hours.

Summary

The process of life is the most remarkable process in all of nature, and the birth of a new foal is a wonderful thing to see. Considerable care must be taken from breeding to birth to ensure that the foal has every chance of surviving and thriving.

Credits

Ensminger, M. Eugene. *Horses and Horsemanship*. 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Hawcroft, Tim. *The Complete Book of Horse Care*. New York: Howell Book House, Inc., 1994.

University of Missouri-Columbia Extension Division agricultural publications

a) G2790: Horse Breeding Arithmetic: 2 + 2 = 1
b) G2791: Genetics of Coat Color of Horses

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Lesson 5:
Herd Health

It is essential that owners have health programs to take care of their horses. For breeders with many horses, it becomes even more important because the herd provides an income. When unsure about an injury's seriousness, contact a veterinarian.

Vaccinations and Vaccines

"An ounce of prevention is worth a pound of cure" describes the importance of preventing problems before they happen. It takes a great deal of time and expensive care to help a sick animal regain its health, compared to the small cost of a vaccine. A vaccination program is recommended to help prevent diseases that are common among horses. There are many different diseases that can affect a horse, and it is best to consult the veterinarian as to what specific diseases should be vaccinated for in the area. The veterinarian can also help with developing a vaccination schedule.

The type of vaccine will vary. Some vaccines provide lifetime protection, while many others need an annual booster. The type of vaccine needed will depend on the protection needed and vaccine availability. Most vaccines today have fewer side effects than vaccines of years ago.

Diseases That Horses Can Be Vaccinated Against

There are many different vaccines available; consult the veterinarian as to what is appropriate in the area. The three most common diseases that horses are vaccinated against are influenza, sleeping sickness, and tetanus.

Influenza is a highly contagious disease that mostly affects young horses. The symptoms include high fever, loss of appetite, weakness, depression, rapid breathing, dry cough, and a watery discharge from the eyes and nostrils that is followed by a yellowish nasal discharge. Mortality (or death rate) is low, but recovery can take weeks or even months.

Sleeping sickness (EEE, WEE, and/or VEE) is carried by mosquitos, and both horses and humans can contract the disease. The symptoms include walking around aimlessly and running into things; depression; grinding of teeth; and paralysis of the limbs, lips, and bladder. The mortality rate can be as high as 90 percent.

Tetanus (lockjaw) usually occurs as the result of an infected wound. Symptoms can include stiffness around the head and difficulty chewing and swallowing. The stiffness or paralysis progresses throughout the body, and muscle spasms can occur. The mortality rate is 80 percent due to the exhaustion and/or paralysis of vital organs.

Viral rhinopneumonitis (Rhino) causes a pregnant mare to abort the foal in the last half of the term. Mares can catch this virus easily from other horses, and the symptoms are similar to a cold or respiratory disease. All horses are susceptible to this virus. Rhino can be prevented by keeping pregnant mares away from others or by keeping them in small groups. Also, weanlings and yearlings should be kept away from pregnant mares.

Strangles (or distemper) is a communicable disease that usually affects younger animals. Symptoms include depression, loss of appetite, high fever, and pus-like discharge from the nostrils. As the disease progresses, glands under the jaw enlarge and become sensitive. These glands can break open, allowing pus to drain out. Strangles can spread to other glands, but as soon as drainage occurs, glands can heal. However, if it spreads to internal organs, the horse may die. Treatment varies and depends on veterinarian recommendations. The spread of strangles can be controlled by keeping infected animals away from non-infected animals. It can also be prevented by vaccinating the entire herd.

Vaccinations might be needed for other diseases, such as rabies and viral arteritis. Consult the local veterinarian for recommendations.

Ailments Common to Horses

Colic can be fatal if not treated properly. Contact the veterinarian as soon as possible. Symptoms include pawing at the ground, looking nervously at the flanks, continually lying down and getting back up, rolling, sweating, constipation, and the absence of normal intestinal sounds. To avoid intestinal twisting (gastric torsion), the horse should not be allowed to roll or get up and down. Walk the horse slowly, if possible, and don't feed it until the veterinarian arrives.

Equine Infectious Anemia (EIA or Swamp Fever) is a serious blood disease. Symptoms can vary but include high intermittent fever, depression, stiffness, weakness, loss of condition and weight, and swelling. An afflicted animal can die within 2-4 weeks. There is no vaccine available. However, a Coggins test can detect the disease. When a positive Coggins test results, the animal should be quarantined and slaughtered.

Potomac Horse Fever is an often fatal form of diarrhea. Symptoms include fever, depression, loss of appetite, colic, and edema (swelling) of the underline (belly). These symptoms are followed by severe watery diarrhea. Many horses with this ailment develop founder, and the mortality rate is about 30 percent. Horses that contract Potomac Horse Fever are given large amounts of fluids intravenously and medications to reduce fever and the chance of founder. A vaccine is available, and a veterinarian should be consulted to see if it is needed in the area.

Salmonella is a bacterium that causes symptoms resembling colic, which makes it difficult to diagnose. Suspected horses should be checked by a veterinarian. Prevention is to keep feed clean and free from contaminates, along with quarantine of new animals.

Dental Care

Because of the way a horse's teeth wear, they will develop sharp edges on the molars that cause cuts to the gums. This will cause pain for the horse as it tries to chew its food (mastication process). For this reason, it becomes necessary to float the horse's teeth (file off the sharp edges).

Observe the horse as it eats. Usually, a horse with this problem will eat very slowly, dribble food out of its mouth, salivate excessively, and might have blood mixed with the saliva. Wasted feed frequently ends up on the ground. As a result, the horse can lose weight and conditioning. Floating the teeth should be done by a veterinarian or someone with experience and training to prevent injury to the horse's mouth.

Parasites

There are two classifications of parasites--internal and external. A parasite is any form of life that lives off of another. Parasites usually don't kill their host but do cause it to be unthrifty and perform at a lower level.

Symptoms of internal parasite infestation include unthriftiness, rough coat, recessed flanks, distended abdomen, and weakness. Prevention involves a deworming program. To prevent parasites from developing an immunity to a specific dewormer, rotate the brands used. There

Table 5.1 - Internal Parasites of Horses

Credit: Controlling Internal Parasites of Horses (G2854)

Parasite	Location	Ages affected	Injury and symptoms
Strongyles	Larvae: arteries, liver and gut wall Adults: large intestine	All ages but young especially susceptible	Retarded growth, loss of weight, poor appetite, rough hair coat, general weakness, anemia, recurrent colic, death
Ascarids	Larvae: liver and lungs Adults: small intestine	Young under 2 years old	Retarded growth, pot bellied, rough hair coat, colic, pneumonia, death (ruptured intestine)
Bots	Eggs: on hair Larvae: tongue Bots: stomach	All ages	Excitement (by flies), colic, retarded growth, poor condition, death (stomach rupture)
Tapeworms	Adults: junction of small intestine with large intestine	Six months or older	Digestive disturbances

are several different types of dewormers on the market; consult the veterinarian as to what will work the best in the area.

Along with a deworming program, make sure the environment around the horse cuts down on many of the problems associated with parasites. Keep stalls and paddocks clean and free from manure buildup. Dragging of fields (to break up manure piles) and rotating pastures will help lower the parasite population. If possible, avoid feeding horses on the ground where they can ingest parasites with the feed; provide a feeder that is clean and above the ground.

There are about 150 different types of parasites that can affect a horse. Some of the most common internal parasites that affect horses are found in Table 5.1.

External parasites include flies, ticks, mosquitos, mites, and lice. Some of these external parasites are the source of the internal parasites, such as the botfly. The botfly lays its eggs on the horse's legs and jaw, and the larvae soon enter the horse's mouth and are swallowed. They are eventually passed back out with the feces and the larva mature to the fly stage, where the cycle starts over again. (See Figure 5.1.)

There are several ways to help reduce external parasites, such as keeping the area clean of manure buildup, not having too many horses in one area, and using insecticides that are especially made for horses. Again, it is wise to contact a veterinarian as to what will work best and be the safest.

First Aid

Lesson 8 discusses the contents of a basic first aid kit. First aid is the immediate and temporary aid given for an animal that has been injured or becomes ill. For any injury involving bleeding, first stop or at least control the bleeding by applying gauze and pressure to the wound. If the wound is slight and bleeding is minimal, applying an antibiotic to the wound might be enough. However, if the wound is worse, a veterinarian should be called to inspect it and decide if stitches are needed.

Foot punctures occur most often. Clean punctures of any dirt or foreign objects. The wound should then be treated with an antiseptic and watched for infection. If the wound has a small opening, enlargement of the opening might be necessary so it will drain. Enlargement of a wound usually requires the services of a veterinarian.

For bites and stings, clean the wound (as with any injury) and apply an antiseptic to the affected area. Determining the cause makes prevention much easier. If the horse acts unusual or has any excess pain or swelling, consult the veterinarian.

For strains, sprains, and swelling, restrict the horse's movements to prevent any further injury and apply cold water to the affected area. These measures help reduce swelling and relieve pain. Apply the cold water intermittently for the first 24 hours, at least. After all swelling has stopped, warm compresses or liniment can be applied to stimulate the healing process.

If a horse is suspected of founder, the veterinarian should be contacted and the horse should be confined in a stall. Don't give feed and restrict it from drinking large amounts of water until the veterinarian advises otherwise.

Summary

The horse's health is in the owner's hands. It is wise to have a trusted veterinarian nearby to answer any health questions that arise. Also, the veterinarian can help create a health program that will help keep animals in good health for years.

Credits

Controlling Internal Parasites of Horses (G2854). University of Missouri-Columbia Extension Division, 1993.

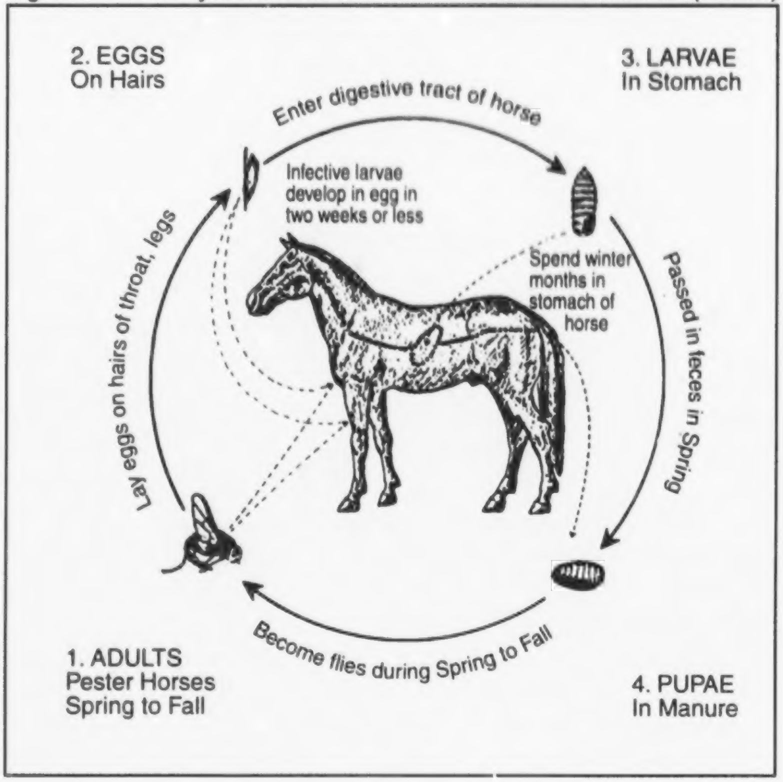
Ensminger, M. Eugene. *Horses and Horsemanship.* 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Fraser, Clarence M., ed. *The Merck Veterinary Manual: A Handbook of Diagnosis, Therapy, and Disease Prevention and Control for the Veterinarian.* 7th ed. Rahway, NJ: Merck & Co., Inc., 1991.

Hawcroft, Tim. *The Complete Book of Horse Care*. New York: Howell Book House, Inc., 1994.

Figure 5.1 - Life Cycles of Botflies

Credit: *Controlling Internal Parasites of Horses (G2854)*


2. EGGS
On Hairs
3. LARVAE
In Stomach
Enter digestive tract of horse
Infective larvae develop in egg in two weeks or less
Lay eggs on hairs of throat, legs
Spend winter months in stomach of horse
Passed in feces in Spring
Become flies during Spring to Fall
1. ADULTS
Pester Horses
Spring to Fall
4. PUPAE
In Manure

Lesson 6:
Hoof Care

The hoof is designed to withstand tremendous amounts of pressure. Normally, it can endure the impacts of walking and running. However, this seemingly indestructible structure can be weakened by something as simple as overeating.

Structures of the Hoof

As the horse is standing, the visible parts of a hoof are the wall, coronary band, perioplic ring, pastern, fetlock, and cannon. (See Figure 6.1.) The hoof wall is made from fibers that grow down from the cornet band (also known as the growth ring). These fibers are parallel to one another. The hoof wall grows approximately 3/8" per month and at a 45-55° angle.

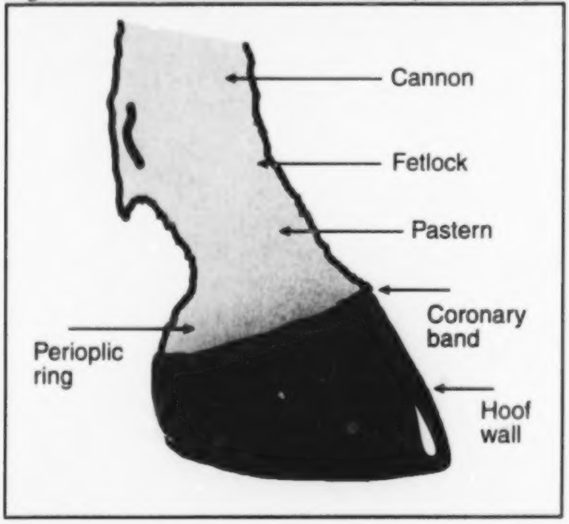
The hoof can be divided into three sections: toe, quarter, and heel. The white line, or inner wall of the hoof, is a softer tissue with a similar cell structure that separates the wall from the sole.

The next structure is the frog. It starts at the heel and projects forward toward the toe in the shape of a V. At the back part of the frog is the expansion point known as the cleft of the frog. The frog's major functions are to allow the hoof to expand and to act as a shock absorber. (See Figure 6.2.) The hoof's inner structure is made up of five major bones--the cannon, long and short pasterns, coffin and navicular. (See Figure 6.3.) These bones are the supporting structures that are responsible for holding the horse's weight. Failure of any one of these bones will cause lameness; if severe enough, it will cause permanent damage.

Inspecting the Hoof

Hoofs should be inspected at regular intervals (daily, if shod). Before and after riding, each hoof should be picked up and cleaned. If the horse is pastured and barefoot, hoofs should be inspected at least twice a week. This assures healthy hoofs and keeps the animal used to having its feet picked up. A person should also be on the lookout for any unusual movements that might indicate lameness. Use *extreme care* when handling hoofs of a horse that has not been handled that much.

Figure 6.1 - External Parts of the Foot (Side View)



When examining the hoof, the first step is to clear away any mud, manure, or foreign matter stuck to the sole. Take care to clean well around the frog. Never cut down the size of the frog, but remove any dead and loose material around the frog.

While cleaning out mud and debris, it is usually very easy to tell if the horse has thrush. Thrush is a fungus that creates a very strong, unpleasant odor. If detected, there are several products to treat this condition. One inexpensive treatment is

Figure 6.2 - External Parts of the Foot (Bottom View)

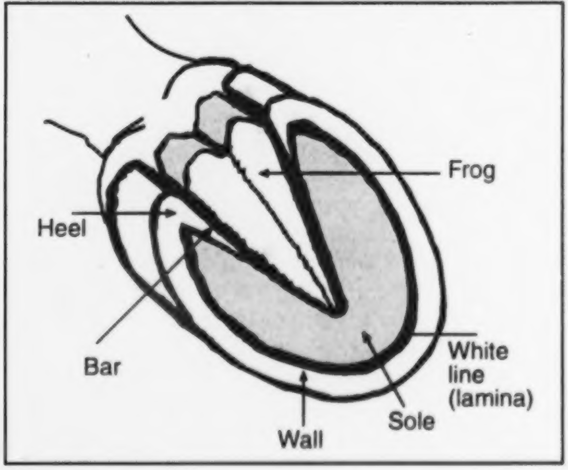
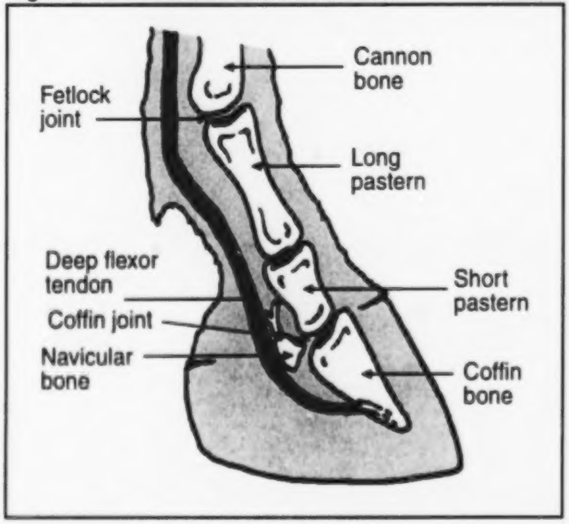


Figure 6.3 - Internal Parts of the Foot



to use a mild solution of bleach water and spray directly on the sole and frog area. Next, check for any chipping or cracking caused from drying out.

If drying becomes a problem, apply a hoof dressing such as neat's-foot oil, sweet oil, linseed oil, or another type of dressing. During extreme dry weather, it is a good idea to apply some type of hoof dressing each time the hoofs are cleaned.

Trimming the Hoof

In the wild, horses have very few problems with their feet. However, during domestication, the horse moved away from the naturally soft pasture to hard surfaces; small paddocks; muddy, urine-filled stalls; and unnatural diets. Therefore, people need to trim and care for the horse's hoof. Any shod horse's hoofs should be trimmed and reshod once a month since the hoof grows about 3/8" in a month's time. Failure to keep the hoof trimmed can cause excess strain on tendons.

Trimming is not something an amateur should attempt. Done incorrectly, it can cause quicking of the hoof or setting the hoof at the wrong angle. Quicking happens when trimming is done too close to the hoof's quick (similar to the quick on a person's fingernail). It can cause some bleeding and leaves an opening for infection. Nipping involves taking a pair of nippers (like large fingernail clippers) and removing a small portion of the hoof all the way around. Filing consists of taking a large rasp and filing smooth the rough edges. This is done after nipping.

Training from a qualified farrier is a good way to learn hoof trimming for one's own animals.

Ways of Shoeing

Shoeing protects the hoof from excessive wear, provides increased traction when trail riding, and helps correct defects in stance or gait. It also helps correct diseases and defects. Furthermore, shoes can help relieve pain and discomfort from such problems as hoof wall cracks, stone bruises, and tendonitis. However, shoeing does not make walking easier or increase agility. It does increase road shock, and nail holes can weaken the hoof wall or provide an access for germs to enter and cause an infection.

There are two styles of shoeing--hot shoeing and cold shoeing. Hot shoeing involves taking a shoe that has been handmade or commercially made, heating it up, and shaping and sizing it to the hoof's shape. Cold shoeing is simply shaping and sizing the shoe without heat treatment. Whichever method is used, shoeing should only be done by a skilled farrier. If not done properly, it can cause some very serious problems.

Hoof Abnormalities

Lameness is simply any condition that affects the horse's feet in an adverse way. Treatment depends on the exact condition. Many things can affect the horse's hoofs; some of these abnormalities follow.

Founder - A serious and common problem is founder (or laminitis), which affects about 100,000 horses a year. It is a breakdown between the soft tissue of the laminae and the hard outer wall of the hoof. It can be brought on by a number of causes, such as overeating grain, lush legumes or grasses (rich in carbohydrates); watering while the horse is hot; or because of uterus inflammation after foaling. Treatment for this condition varies, depending on the severity. Regardless, treatment should be immediate to reduce the risk of permanent damage or death.

Stone bruise - Another common problem is stone bruising. Frequently, a bruise to the sole of the hoof is caused by a hard object (usually a stone or chunk of frozen soil). The main concern is that the injury does not form an abscess and cause further complications. Treatment is to let the animal rest and not use the hoof any more than necessary. If an abscess does develop, a veterinarian should be called.

Naviculitis - Naviculitis (navicular disease) is a disease of the navicular bone and bursa in the front feet. In some cases, the bone can rotate downward. (See Figure 6.4.) The cause may be difficult or even impossible to determine, and treatment will vary from animal to animal. Some animals may respond to corrective shoeing, while others may require therapy by a veterinarian. In most cases, recovery is limited.

Thrush - One of the most preventable diseases a horse can contract, thrush is caused by an anaerobic bacterium that grows around the frog of the hoof, causing a foul odor. The main cause of thrush is unsanitary stall conditions--wet and urine-soaked bedding--that the horse is left to stand in for extended periods of time. Treatment is to first clean the stall and keep it clean. Treat the affected hoof with a disinfectant-like bleach, iodine, copper sulphate, or copper naphthenate.

Hoof cracks - Also known as quarter cracks and toe cracks, these vertical cracks develop in the hard, outer surface of the hoof and vary in length. The cause is usually from the hoof becoming too dry or from improper shoeing. The treatment is to use special shoes that protect the hoof and prevent it from cracking further. Another treatment is to file or burn the top of the crack with a hot bar in a half-moon shape. Prevention includes applying some type of hoof dressing or, during very dry weather, moistening the soil around watering troughs.

Summary

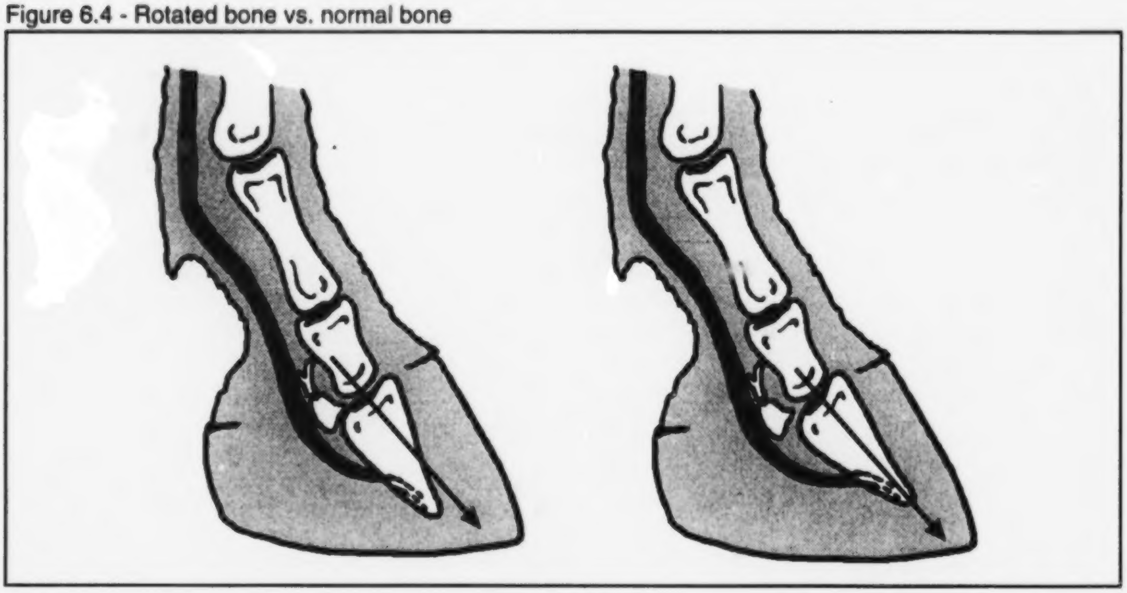
The horse's hoof is a complex structure that can withstand the pressures of walking and running. However, the horse's hoof can be damaged relatively easily through improper care by its owner or handler. An animal's health depends greatly on the condition of its feet.

Credits

OSU Extension Facts No. 9115. Stillwater, OK. Division of Agricultural Science and Natural Resources, Oklahoma State University, 1990.

Horse Safety: Catching, Leading and Grooming (G2880). University of Missouri-Columbia: Extension Division, 1993.

Figure 6.4 - Rotated bone vs. normal bone



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Lesson 7:
Nutrition

Providing a properly balanced ration is vital for care of the horse. Grain and hay must be clean and free from dust and molds. It is important to understand how the horse's digestive tract uses the nutrition that is provided.

Anatomy of the Simple Digestive Tract

Horses differ from cattle in that a cow has a four-chambered stomach, while the horse only has one. The horse's stomach holds about 8-16 quarts, depending on the size of the animal. Feed that is taken into the stomach passes through it very quickly, and not much digestion or absorption takes place in the stomach.

The horse's digestive system consists of the following organs: mouth, esophagus, simple stomach, small intestine, cecum, large intestine, colon, and rectum. The mouth is responsible for taking in and chewing (masticating) the feed; this is where digestion begins. The mouth also adds saliva to the feed to allow it to pass down the esophagus, which is the next organ in the digestive tract. The esophagus transports feed from the mouth to the stomach. After leaving the stomach, feed passes into the small intestine, which is about 70 feet long. To aid in the break down of the feed, enzymes are added from the liver and the pancreas. At the site where the large

Table 7.1 - Light Horse Feeding Guide[1]

Credit: *Horses and Horsemanship*, p. 218. Used with permission.

Age, sex, and use	Daily allowance	Kind of hay
Stallions in breeding season (weighing 900-1,400 lb.)	¾-1½ lb. grain per 100 lb. body weight, together with a quantity of hay within same range	Grass-legume mixed; or ⅓-½ legume hay, with remainder grass hay.
Pregnant mares (weighing 900-1,400 lb.)	¾-1½ lb. grain per 100 lb. body weight, together with a quantity of hay within the same range.	Grass-legume mixed; or ⅓-½ legume hay, with remainder grass hay. (Straight grass hay may be used in the first half of pregnancy.)
Foals before weaning (weighing 100-350 lb. with projected mature weights of 900-1,400 lb.)	½-¾ lb. grain per 100 lb. body weight, together with a quantity of hay within same range.	Legume hay.
Weanlings (weighing 350-450 lb.)	1-1½ lb. grain and 1½-2 lb. hay per 100 lb. body weight.	Grass-legume mixed; or ½ legume hay, with remainder grass hay.
Yearlings, second summer (weighing 450-700 lb.)	Good, luxuriant pastures. (If in training for other reasons without access to pastures, the ration should be intermediate between the adjacent upper and lower groups.)	
Yearlings, or rising 2-year-olds, second winter (weighing 700-1,000 lb.)	½-1 lb. grain and 1-1½ lb. hay per 100 lb. body weight.	Grass-legume mixed; or ⅓-½ legume hay, with remainder grass hay.
Light horses at work; riding, driving, and racing (weighing 900-1,400 lb.)	• Hard use--1¼-1⅓ lb. grain and 1-1¼ lb. hay per 100 lb. body weight. • Medium use--¾-1 lb. grain and 1-1¼ lb. hay per 100 lb. body weight. • Light use--⅖-½ lb. grain and 1¼-1½ lb. hay per 100 lb. body weight.	Grass hay.
Mature idle horses; stallions, mares, and geldings (weighing 900-1,400 lb.)	1½-1¾ lb. hay per 100 lb. body weight.	Pasture in season; or grass-legume mixed hay.

[1] With all rations and for all classes and ages of horses, provide free access to a mineral box as follows: (1) Where the pasture or hay is primarily grass, use a mixture containing 2 parts of calcium to 1 part of phosphorus; and (2) where the pasture or hay is primarily a legume, use a mixture containing 1 part of calcium to 1 part of phosphorus. To each of these mixes, add ⅓ salt (trace mineralized) to improve acceptability. If preferred, a good commercial mineral can be used. Self-feed salt separately.

liver and the pancreas. At the site where the large and small intestines meet, the cecum is connected. It is about 4 feet long and about one foot in diameter, which is much larger than that of a cow's, pig's or human's. The cecum is also called the water gut. In the horse, it is where digestion (fermentation) continues and nutrients that are ready for absorption are absorbed.

After feed passes from the cecum, it goes through the large intestine, where more absorption takes place. In the colon, moisture from the feed is removed and the undigested feed is balled up and excreted through the rectum.

Colic

Colic is a generic term that simply means abdominal discomfort. This can be severe and even fatal for the horse. The horse's stomach is designed to take in feed frequently in small quantities. In the wild, the horse eats at an almost continual rate. Because of the horse's domestication, it does not always get the chance to eat as it would in the wild, and overfeeding is the main cause of colic. People feed the horse two or three larger meals, which sometimes causes intestines to become blocked (impacted). This can be serious or even fatal, if not promptly treated by a veterinarian.

Nutritional Requirements of the Horse

Each horse has different needs, depending on the size, age, and activity level (work load) of the horse. Other factors that affect nutritional requirements are breeding, lactation, weather conditions, stress, and quality of feed. Table 7.1 shows the recommended nutritional requirements of the different light horses.

Factors Affecting Digestion

In the horse, it takes about 24 hours to completely empty the stomach, as compared to the cow's, which takes about 72 hours. Outside factors influence this rate of digestion, such as stress, body condition or feed quality. If a horse is being worked or becomes frightened, digestion slows down or may even stop temporarily. The horse processes much of its food in the cecum. The horse's simple digestive system does not break down as much food as a cow's (about 30 percent, compared to about 70 percent).

The Importance of Water

Of all the nutrients required by the horse, the cheapest and most important one is water. The horse can go much longer without feed than it can without water. If a horse lost only 20 percent of its body's water from dehydration, it would die. Water is necessary for the production of saliva, cell formation within the body's organs, as a medium to carry nutrition to the body's cells, temperature control, lubrication, and in chemical reactions.

In cool weather, a horse drinks approximately 0.5 gallon of water per hundred-weight daily. In hot weather, when working hard and when nursing, a horse needs about 1.5 gallons of water daily. Give the horse free access to clean water. However, do not let a horse drink heavily after or before doing heavy work or exercise, as this can cause foundering. Keep water fresh, cool in the summer, and about 40 degrees F in the winter.

Feed Types

There are many different types of feed available. They are grouped as grains, roughage, supplements, minerals, and vitamins. The one constant is that they all must be clean and free from dust and molds. The feed used will depend on cost, availability, and owner personal preferences. The most common grains fed to horses are oats and corn.

Many people buy feed that as been premixed with added vitamins and minerals. This has some advantages and some disadvantages. An obvious advantage is one of convenience. Many owners who have only a few animals do not have the equipment or storage facilities to mix their own rations. Another advantage is that they do not have to buy large quantities, so there is less money tied up in feed. Disadvantages are that they cannot control the exact amounts of the ingredients in the ration, and premixed feed is more expensive to buy.

Hay needs to be clean and free from dust and molds, which can cause a horse to colic. Along with its grain, a horse only needs about 1 percent of its body weight in roughage per day. (See Table 7.1.)

In addition to the ration, horses should have access to a mineral box with either loose or block mineral. These mineral feeders are usually freely available and are a combination mineral-vitamin-salt blocks.

The important thing is that all horses are different and will require different amounts of feed. All feed charts are meant to be used as guides when choosing a feed. Horses should be fed and watered, if water is not given free choice, at about the same time each day. It is important to avoid sudden changes in feed type or amount to avoid problems with colic or founder.

Table 7.2 - Toxic Plants

- Acorns
- Bracken fern
- Dallis grass
- Hairy vetch
- Horsetail
- Locoweed
- Nightshade
- Oak
- Onion
- Red maple
- Sorghum/Sudan
- Sweet clover
- Yellow star thistle

Determining What Feeds Are Used

The feed type used is decided by cost and availability. In some areas, certain feeds are not grown, and they are unavailable or too expensive to be practical. Medical condition is one factor affecting feed choice. After a horse has had colic, a veterinarian might put it on a bran mash until it has recovered. Likewise, if a mare is in heavy lactation, she may be put on a high protein diet.

Nutrition-Related Problems

There are many nutrition-related problems that a horse can experience. Probably the most common and serious two are colic and founder (laminitis). Both cause millions of dollars in losses yearly and are probably preventable in most cases. (See Lesson 5 for more on colic; review Lesson 6 for more information on founder.)

Epiphysis is a nutritional disease that sometimes affects young horses. It involves swelling around the growth plates of the long, leg bones; the cause is believed to be malnutrition.

Vitamins are very important for good health and should be included in the horse's ration. For example, a lack of Vitamin D can cause rickets. However, overfeeding vitamins can be as harmful as the lack of vitamins. (Refer to Table 7.3.)

Horses can develop nutritional problems by ingesting toxic plants in their hay or in the field. It is a good idea to find out what plants grow in the area in order to get rid of any that could be harmful. Table 7.2 lists poisonous plants found in temperate North America; consult an Extension agent to help identify these plants.

There are many other types of plants that can be toxic to the horse. Contact the veterinarian or Extension agent to find out what plants are a problem in the area.

One toxicity problem horses have is with alfalfa hay infested with blister beetles. These beetles contain a substance called cantharis. This toxin is very irritating to the horse's intestines, and if the horse eats enough of them, it can cause death. In areas that have problems with blister beetles, all hay should be checked for signs of the beetles.

Tying up syndrome is also called Monday morning sickness or azoturia. Symptoms include rapid pulse, sweating, muscle stiffening (especially in the hindquarters). The exact cause is unknown. Tying up is usually associated with heavy exercise followed by a rest period, during which high-energy feed is fed. In severe cases, permanent lameness can result. To lessen the chances of tying up, limit the amount of high-energy feed during rest periods. Treatment involves keeping the animal quiet, sheltered, and standing until a veterinarian can examine it.

Summary

In the wild, the horse was able to take care of all its needs and usually had few problems. The domesticated horse depends on people to provide all its nutritional needs. It is the responsibility of the owner to make sure the horse has the proper nutrition at all times.

Credit

Ensminger, M. Eugene. *Horses and Horsemanship*. 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Table 7.3 - Horse Vitamin Chart **Credit:** *Horses and Horsemanship*, pg. 194-199. Used with permission.

Vitamins which may be deficient under normal conditions				
	Conditions usually prevailing where deficiencies are reported	**Function of vitamin**	**Some deficiency symptoms**	**Practical sources of the vitamin**
Fat-soluble vitamins:				
A	• Extended drought, bleached hays. Stall feeding where there is little or no green forage or yellow corn. • Following great stress, as when race or show horses are put in training. • The younger the animal, the quicker vitamin A deficiencies will show up. Mature animals may store sufficient A to last 6 months.	• Promotes growth and stimulates appetite. • Assists in reproduction and lactation. • Keeps the mucous membranes of respiratory and other tracts in healthy condition. • Makes for normal vision. Prevents night blindness.	Loss of appetite, poor growth, reproductive problems, nerve degeneration, night blindness, lachrymation (tears), keratinization of the cornea and skin, uneven and poor hoof development, a predisposition to respiratory infection, incoordination, progressive weakness, convulsive seizures, certain bone disorders, and finicky appetite.	• Stabilized vitamin A. • Green grass. • Green grass or legume hay not more than 1 year old. • Carrots, yellow corn.
D	Limited sunlight and/or limited sun-cured hay, especially when the horse is kept inside most of the time.	Assimilation and utilization of calcium and phosphorus, necessary in normal bone development--including the bones of the fetus.	• Rickets in foals, osteomalacia in mature horses. Both conditions result in large joints and weak bones. • Rickets is characterized by reduced bone calcification, stiff and swollen joints, stiffness of gait, irritability, and reduction in serum calcium and phosphorus. • Osteomalacia results in bones which soften, become distorted, and fracture easily.	• Either vitamin D_2 (the plant form) or D_3 (the animal form) is equally effective for the horse. • Exposure to sunlight. • Sun-cured hays.
E	More vitamin E may be destroyed or used by horses during times of stress or strain than can be obtained through normal feeds.	• As an antioxidant. • As an occasional replacement for selenium. Improves reproduction. Prevents anhidrosis.	• Lowered breeding performance in both mares and stallions. • Anhidrosis--a dry, dull hair coat; elevated temperature; and high blood pressure. Anhidrosis has been successfully treated by the oral administration of 1,000-3,000 IU of vitamin E daily.	• Alpha-tocopherol acetate, a stable form of vitamin E. • Wheat germ meal and wheat germ oil. • Green plants. • Green hays.
K	Following intestinal disorders.	Concerned with blood coagulation. It converts precursor proteins to the active blood clotting factors.	Increased clotting time of the blood and lowered level of prothrombin.	• Green pasture. • Well-cured hays. • Cereal grains. • Milk. • Menadione (vitamin K_3).
Water-soluble vitamins:				
Biotin	Sulfa drugs kill intestinal organisms; hence, when they are used an extended period, there may be a deficiency of biotin.	Biotin plays an important role in the metabolism of carbohydrates, fats, and proteins.	In all animals, a deficiency of biotin will depress growth and cause a loss of hair and/or a dermatitis.	Alfalfa hay, blackstrap molasses, cottonseed meal, soybean meal, peanut meal, milk, wheat bran, synthetic biotin, and yeast (brewers', torula).
Choline	Ration low in methionine, an amino acid.	Prevention of fatty livers, the transmitting of nerve impulses, and the metabolism of fat.	Slow growth and fatty livers are the deficiency symptoms.	• Feed sources, such as alfalfa hay, blackstrap molasses, and cereal grains. • Body manufacture of choline from excess of the amino acid methionine. • Choline chloride. • Choline dihydrogen.
Folacin (Folic Acid)		In all vertebrates, folacin is essential for normal growth and reproduction, for the prevention of blood disorders, and for important biochemical mechanisms in each cell.	• Poor growth. • Anemia.	• Alfalfa hay, the oil meals (soybean, cottonseed, and linseed), skimmed milk, and wheat and wheat by-products. • Synthetic folacin, wheat germ, and yeast (brewers', torula).

Classes/Function	Nutrient requirements [12]			Nutrient allowances [12]			Comments
	Per horse daily	In ration A-F	Per ton ration A-F	Per horse daily	In ration A-F	Per ton ration A-F	
	(IU)	(IU/lb.)	(IU/ton)	(IU)	IU/lb.)	(IU/ton)	• Vitamin A is not synthesized in the cecum. • Hay more than 1 year old, regardless of green color, is usually not an adequate source of carotene or vitamin A activity. • When deficiency symptoms appear, add stabilized vitamin A to the ration. • It is wasteful to feed more vitamin A than is needed. Also, exceedingly high levels more than an extended period of time may cause bone fragility, hyperostosis, and exfoliated epithelium.
Maintenance: 1,000 lb. (*454 kg*) horse	22,725	909	1,818,000	26,134	1,045	2,090,700	
Gestation/Lactation: 1,000 lb. (*454 kg*) mare	34,100	1,364	2,728,000	39,215	1,569	3,137,200	
Growth: 450 lb. (*204.5 kg*) weanling	10,908	909	1,818,000	12,544	1,045	2,090,700	
Working: 1,000 lb. (*454 kg*) horse	22,725	909	1,818,000	26,134	1,045	2,090,700	
Maintenance: 1,000 lb. (*454 kg*) horse	3,400	136	272,000	3,910	156	312,800	• The requirement is less when a proper balance of calcium and phosphorus exists in the ration. • When animals are exposed to direct sunlight, the ultraviolet light produces vitamin D from traces of cholesterol in the skin. Stabled horses exercised in the early morning will not get sufficient vitamin D. • Too much vitamin D may harm a horse. Toxicity is characterized by calcification of the blood vessels, heart, and other soft tissues, and by bone abnormalities. A toxic level of vitamin D has not been established in the horse, but a level 50 times the requirement may be harmful.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare	6,825	273	546,000	7,849	314	627,900	
Growth: 450 lb. (*204.5 kg*) weanling	4,368	364	728,000	5,023	419	837,200	
Working: 1,000 lb. (*454 kg*) horse	3,400	136	272,000	3,910	156	312,800	
Maintenance: 1,000 lb. (*454 kg*) horse	575	23	46,000	661	26	52,900	Utilization of vitamin E is dependent on adequate selenium.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare	900	36	72,000	1,035	41	82,800	
Growth: 450 lb. (*204.5 kg*) weanling	432	36	72,000	497	41	82,800	
Working: 1,000 lb. (*454 kg*) horse	900	36	72,000	1,035	41	82,800	
	(mg)	(mg/lb.)	(mg/ton)	(mg)	(mg/lb.)	(mg/ton)	
Maintenance: 1,000 lb. (*454 kg*) horse				8.0	0.32	640	• High levels of vitamin K will overcome bleeding due to dicoumarol. • Vitamin K is generally (1) widely distributed in normal feeds, and/or (2) synthesized in adequate amounts by the intestinal microflora of the horse.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				8.0	0.32	640	
Growth: 450 lb. (*204.5 kg*) weanling				3.6	0.30	600	
Working: 1,000 lb. (*454 kg*) horse				8.0	0.32	640	
Maintenance: 1,000 lb. (*454 kg*) horse				2.5	0.1	200	Biotin is closely related metabolically to folacin, pantothenic acid, and vitamin B-12.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				2.5	0.1	200	
Growth: 450 lb. (*204.5 kg*) weanling				1.2	0.1	200	
Working: 1,000 lb. (*454 kg*) horse				2.5	0.1	200	
Maintenance: 1,000 lb. (*454 kg*) horse				500	20.0	40,000	Choline content of normal feeds is usually sufficient.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				750	30.0	60,000	
Growth: 450 lb. (*204.5 kg*) weanling				750	62.5	125,000	
Working: 1,000 lb. (*454 kg*) horse				750	30.0	60,000	
Maintenance: 1,000 lb. (*454 kg*) *horse*				20	0.8	1,600	Folacin is widely distributed in horse feeds. Also, folacin is synthesized in the lower gut.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				30	1.2	2,400	
Growth: 450 lb. (*204.5 kg*) weanling				36	3.0	6,000	
Working: 1,000 lb. (*454 kg*) horse				30	1.2	2,400	

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Vitamins which may be deficient under normal conditions

	Conditions usually prevailing where deficiencies are reported	Function of vitamin	Some deficiency symptoms	Practical sources of the vitamin
		Fat-soluble vitamins:		
Niacin (Nicotinic Acid, Nicotinamide)		Constituent of two important coenzymes. They are involved in the release of energy from carbohydrates, fats, and proteins, and in the synthesis of fatty acids, protein, and DNA.	• Reduced growth and appetite. • Skin rashes, diarrhea, nerve disorders.	• Green alfalfa. • Niacin is widely distributed in feeds; fermentation solubles and certain oil meals are especially good sources. • Synthetic niacin.
Pantothenic Acid (Vitamin B-3)		Part of coenzyme A, which plays a key role in body metabolism.	Poor growth, skin rashes, poor appetite, nervous disorders.	• Safflower meal, blackstrap molasses, wheat bran, and milk. • Calcium pantothenate.
Riboflavin (Vitamin B-2)	When green feeds (pasture, hay, or silage) are not available.	Riboflavin has an essential role in the oxidative mechanisms of the cells.	• Periodic ophthalmia (or moon blindness), characterized by catarrhal conjunctivitis in one or both eyes, accompanied by photophobia, and lachrymation. • Decreased rate of growth and feed efficiency. • Porous and weak bones; ligaments and joints impaired.	• Green pasture. • Green hay. • Milk and milk products. • Synthetic riboflavin. • Yeast.
Thiamin (Vitamin B-1)	• Poor-quality hay and grain. When sulfa drugs or antibiotics are given to the horse, the synthesis of B vitamins is impaired. • Consumption of bracken fern (*Pteris aquilina*) and horsetail (*Equisetum* spp) will cause thiamin deficiency due to the antithiamin compounds that they contain.	• In energy metabolism. Without thiamin, there would be no energy. • In the working of the peripheral nerves. • Promotes appetite and growth.	• A thiamin deficiency has been produced experimentally. • Decreased feed consumption (loss of weight), anemia, incoordination (especially in the hindquarters), lowered blood thiamin, elevated blood pyruvic acid, enlarged heart, and nervous symptoms.	• Wheat and wheat by-products. • Oilseed meals. • Oat grain and groats. • Thiamin hydrochloride. • Yeast (brewers', torula).
Vitamin B-6 (Pyridoxine, Pyridoxal, Pyridoxamine)		In its coenzyme forms, it is involved in a large number of physiologic functions, particularly protein, carbohydrate, and fat metabolism.	No deficiency symptoms of vitamin B-6 have been reported in the horse. So, it is thought to be synthesized in the cecum.	Green pasture, alfalfa hay, wheat bran, wheat germ, and yeast (brewers', torula).
Vitamin B-12 (Cobalamins)	• When few, or no feeds of animal origin are fed. • Where cobalt is not present in the feed, thereby precluding the synthesis of vitamin B-12 in the gastrointestinal tract.	• Coenzyme in several enzyme systems. • Closely linked with choline, folacin, and pantothenic acid.	Loss of appetite and poor growth.	• Protein supplements of animal origin. • Fermentation products. • Cobalamins, yeast.
Vitamin C (Ascorbic Acid, Dehydroascorbic Acid)	The vitamin C requirements of fish and humans have been observed to increase in periods of stress. It is conjectured that heavily stressed horses may require more vitamin C than they can synthesize.	• Formation and maintenance of collagen. • More rapid healing of wounds. • Sound bones.	No deficiency symptoms in horses noted.[1] In humans and monkeys, scurvy is the main deficiency symptom. In humans, sudden death from severe internal hemorrhage and heart failure is always a danger.	• Ordinary rations and body synthesis provide adequate vitamin C for horses. • Well-cured hays and green pastures are good sources of vitamin C.
Unidentified Factors	Since the U.S. foal crop is only around 50 percent, it is obvious that there is room for improvement, and perhaps unidentified factors are involved. Also, optimal results with horses during the critical periods (growth, gestation-lactation, and when under stress as in racing or showing) appear to be dependent upon providing unidentified factors through such ingredients as distillers' dried solubles, dehydrated alfalfa meal, condensed fish solubles, brewers' dried yeast, antibiotic fermentation residues, dried whey, and corn fermentation solubles.			

[3] Feed consumption of mature 1,000 lb. *(454 kg)* horse estimated at 25 lb. *(11.36 kg)* per day. Feed consumption of a 450 lb. *(204.5 kg)* weanling is estimated at 12 lb. *(5.45 kg)* per day.

Classes/Function	Nutrient requirements [1,2]			Nutrient Allowances [1,2]			Comments
	Per horse daily	In ration A-F	Per ton ration A-F	Per horse daily	In ration A-F	Per ton Ration A-F	
Maintenance:	(IU)	(IU/lb.)	(IU/ton)	(IU)	(IU/lb.)	(IU/ton)	• There is some evidence that niacin is synthesized by the horse. • The horse can convert the essential amino acid tryptophan into niacin. Hence, it is important to make certain that the ration is adequate in niacin; otherwise, the horse will use tryptophan to supply niacin needs.
1,000 lb. (*454 kg*) horse				250	10.0	20,000	
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				250	10.0	20,000	
Growth: 450 lb. *(204.5 kg)* weanling				250	20.8	41,600	
Working: 1,000 lb. *(454 kg)* horse				250	10.0	20,000	
Maintenance: 1,000 lb. (*454 kg*) horse				250	10.0	20,000	• Grain is very deficient in pantothenic acid. • Of all the B vitamins, pantothenic acid is most likely to be deficient under stable (confinement) conditions.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				250	10.0	20,000	
Growth: 450 lb. *(204.5 kg)* weanling				250	20.8	41,600	
Working: 1,000 lb. *(454 kg)* horse				250	10.0	20,000	
Maintenance: 1,000 lb. (*454 kg*) horse	22.8	0.91	1,820	40.0	1.6	3,200	Lack of vitamin B-2 is not the only cause of moon blindness. Sometimes, moon blindness follows leptospirosis, and it may be caused by an allergic reaction.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare	22,8	0.91	1,820	40.0	1.6	3,200	
Growth: 450 lb. *(204.5 kg)* weanling	10.9	0.91	1,820	19.2	1.6	3,200	
Working: 1,000 lb. *(454 kg)* horse	22.8	0.91	1,820	40.0	1.6	3,200	
Maintenance: 1,000 lb. (*454 kg*) horse	34.1	1.36	2,720	39.2	1.57	3,140	• Thiamin is synthesized in the lower gut of the horse by bacterial action, but there is some doubt as to its sufficiency. • When neither green pasture not high-quality roughage is available, thiamin hydrochloride should be added to the ration. • Since carbohydrate metabolism is increased during physical exertion, it is important that B-1 be available in quantity at such times.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare	34.1	1.36	2,720	39.2	1.57	3,140	
Growth: 450 lb. *(204.5 kg)* weanling	16.4	1.36	2,720	18.9	1.57	3,140	
Working: 1,000 lb. *(454 kg)* horse	56.8	2.27	4,540	65.3	2.61	5,220	
Maintenance: 1,000 lb. (*454 kg*) horse				25.0	1.0	2,000	Normally, horse rations contain adequate vitamin B-6. Also, it appears to be synthesized in the cecum. Yet, these sources may not be adequate for the maximum performance of the horse.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				25.0	1.0	2,000	
Growth: 450 lb. *(204.5 kg)* weanling				6.0	0.5	1,000	
Working: 1,000 lb. *(454 kg)* horse				25.0	1.0	2,000	
Maintenance: 1,000 lb. (*454 kg*) horse				0.125	0.005	10	It is reported that horses in poor nutritional condition showing anemia respond to the administration of vitamin B-12.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				0.150	0.006	12	
Growth: 450 lb. *(204.5 kg)* weanling				0.084	0.007	14	
Working: 1,000 lb. *(454 kg)* horse				0.150	0.006	12	
Maintenance: 1,000 lb. (*454 kg*) horse				60	2.4	4,800	Dietary need is clearly evident for humans, monkeys, guinea pigs, fruit-eating bats, and bulbul birds. However, vitamin C is probably required by other species, but synthesized in the body; the only question is whether the horse can synthesize enough vitamin C when under stress.
Gestation/Lactation: 1,000 lb. (*454 kg*) mare				100	4.0	8,000	
Growth: 450 lb. *(204.5 kg)* weanling				45	3.75	7,500	
Working: 1,000 lb. *(454 kg)* horse				100	4.0	8,000	

[1] As used herein, the distinction between "nutrient requirements" and "nutrient allowances" is as follows. In nutrient requirements, no margins of safety are included intentionally, whereas in nutrient allowances, margins of safety are provided in order to compensate for variations in feed composition, environment, and possible losses during storage or processing. The nutrient requirements in this table were adapted by the authors from *Nutrient Requirements of Horses*, 5th rev. ed., NRC-National Academy of Sciences, 1989. The nutrient allowances were developed by the author, based on experiments and experiences; it is intended that they meet the nutrient requirements and provide adequate margins of safety, in addition.

Lesson 8:
Equipment and Facilities

With horses, having good equipment and facilities is a must, given the horse's strength. Buildings provide a safe environment from the elements and pests, along with providing a place to care for sick or injured animals. Using equipment that is in poor condition can result in injury to the horse and/or the handler.

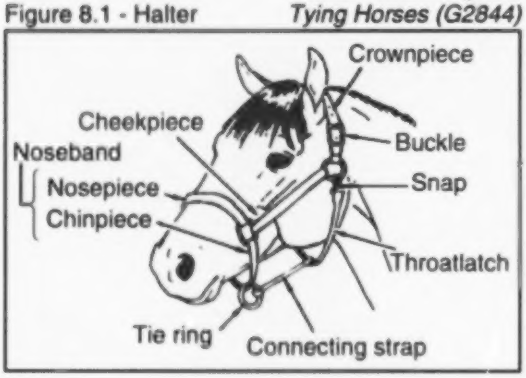
Types and Uses of Tack

Tack comes in many varieties and generally refers to any equipment that is used during riding or handling. Styles of tack include Western, English, show, and work. The type of tack used will depend on what the rider wants to accomplish. For example, if one is working cattle, a show saddle is not appropriate.

The halter and bridle are tack that a rider/handler uses to communicate with the horse and give directions. The halter is simply a bridle that doesn't have a bit connected to it. (See Figure 8.1). A halter can be made out of nylon webbing, rope, or leather. Each material has advantages and disadvantages. The rope halter is inexpensive and easily made, but easier for the horse to break. Nylon halters are more expensive than rope halters but are stronger and easier to find. The leather halter is the most expensive but also the most attractive and is used when showing.

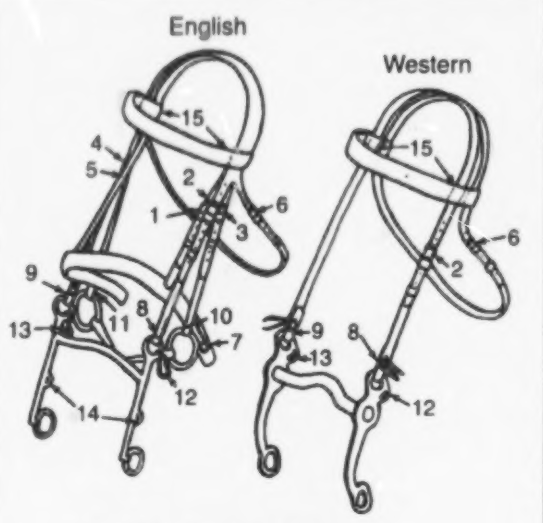
A bridle's main function is to hold the bit in the horse's mouth, which transmits commands from the rider. There are two main types of bridles--Western and English. (See Figure 8.2.) There are many variations of both and many different types of bits that can be used.

Figure 8.1 - Halter **Credit:** *Haltering and Tying Horses (G2844)*



The saddle is the next piece of tack. (See Figure 8.3.) There are two main styles--Western and English. The main difference between the two saddles is that the Western saddle has a high pommel and cantle, and the English saddle looks

Figure 8.2 - Bridle Nomenclature and Adjustment Points **Credit:** *Choosing, Assembling, and Using Bridles (G2845)*



Bridle Adjustment Points

1. Left Cavesson Cheekpiece
2. Left Curb Headstall Cheekpiece
3. Left Bridoon Cheekpiece
4. Right Curb Headstall Cheekpiece
5. Right Bridoon Cheekpiece
6. Throatlatch
7. Cavesson
8. Left Curb Bit Attachment
9. Right Curb Bit Attachment
10. Left Bridoon Attachment
11. Right Bridoon Attachment
12. Left Curb Chain Hook
13. Right Curb Chain Hook
14. Lip Strap Hooks
15. Browband

almost flat. The Western saddle was designed for use by cowboys as they worked and roped cattle.

A saddle pad goes between the horse's back and the saddle to protect the horse from the rubbing of the saddle as the horse moves. Saddle pads come in several sizes and thicknesses; the one chosen will depend on the specific saddle.

Blankets are used to cover a horse in the winter or on cool nights if the horse has been sweating from exercise. This lessens the chance of a horse catching cold or coming down with pneumonia.

There are many different accessories that can be used when riding for pleasure or when working cattle. Some accessories most commonly used are: chaps, which are made out of leather and protect the rider's legs; spurs, which attach to a boot's heel and help give commands to the horse; and splints, which go on the horse's front legs to protect it from injury. Some horse owners will need harness, also. (See Figure 8.5.)

Adjusting Tack

The size of the horse is the deciding factor for choosing appropriate equipment. It is very important that all tack be properly fitted to the horse. If the bridle is too loose, the rider might not be able to get the horse to respond and might lose control. If it is too tight, it can injure the horse. A properly adjusted bridle will only cause one or two wrinkles in the corners of the horse's mouth.

The throat latch strap should be adjusted to allow two or three fingers between it and the horse's jaw. If the throat latch is too small, it will restrict the horse's head and could interfere with breathing.

The saddle should be of proper size for the horse and rider. The saddle blanket should fit the saddle. Before saddling a horse, make sure that the horse's back and girth (mid-section) are clean, as well as the girth strap and saddle blanket. The girth strap should be tightened firmly, but the gullet (the under side of the pommel) should not rub the horse's withers (front shoulders).

Equipment adjustment will vary, depending on the style of equipment used.

Bits and How They Work

Bits are the mechanical means from which cues are communicated to the horse from the rider. There are various types of bits, and the one used will depend on the horse and the style of riding. Some of the more common bits are snaffle, curb, pelham, rearing, hackamore, and bosal. Bits act

Figure 8.3 - Saddle Styles

Credit: *Equine Management and Production*, pg. H1-5. Used with permission.

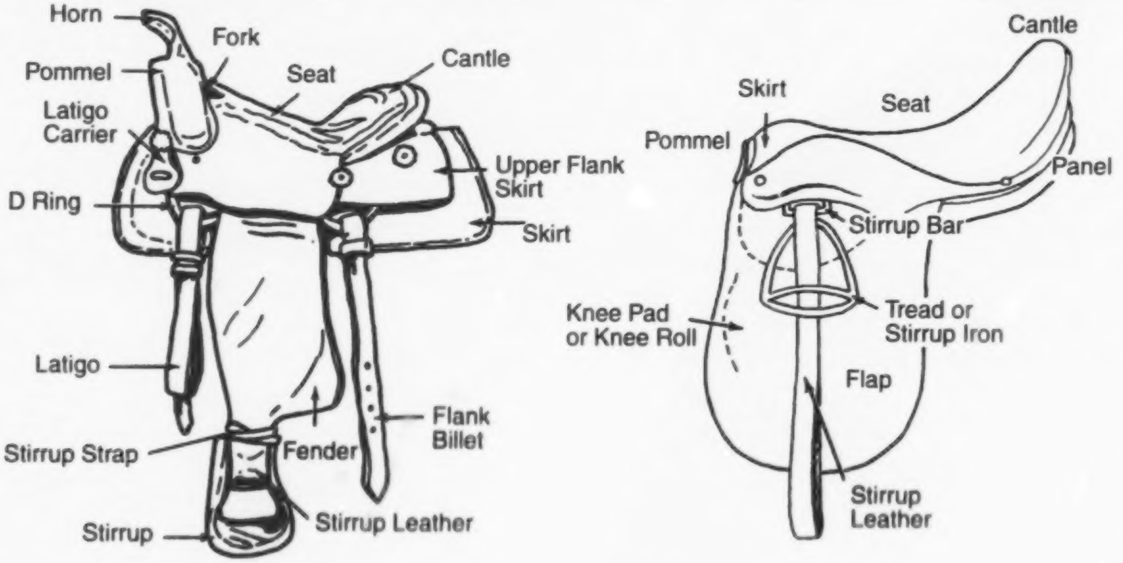
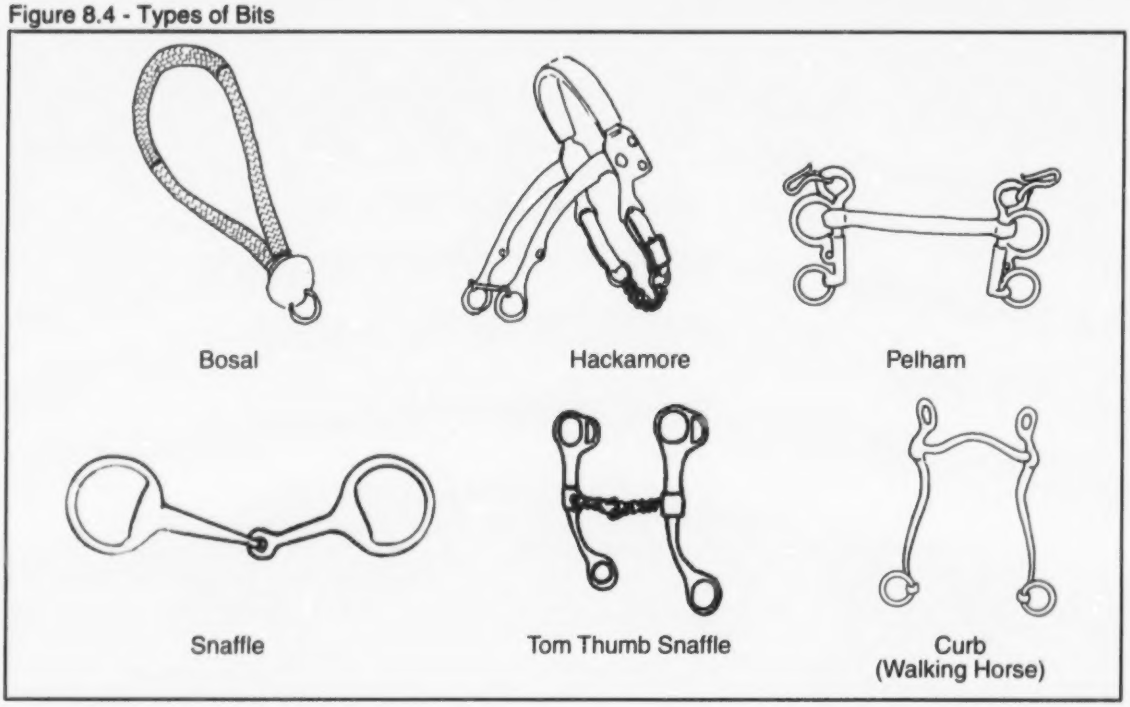


Figure 8.4 - Types of Bits



Bosal

Hackamore

Pelham

Snaffle

Tom Thumb Snaffle

Curb
(Walking Horse)

Some of the more common bits are snaffle, curb, pelham, rearing, hackamore, and bosal. Bits act on pressure points on the horse's head, such as the poll, nose, lips, chin, tongue, and the roof of the mouth.

The snaffle bit is a mouthpiece with a ring at each end where the reins attach. When the rider pulls on the reins, it puts direct pressure on the corner of the horse's mouth. The smaller the diameter of the mouthpiece, the harsher the bit is. The snaffle bit can be a solid piece or a piece that is jointed in the middle. Some will have a cheek piece to prevent the bit from being pulled through the horse's mouth. (See Figure 8.4.)

Curb bits have shanks that act as levers. Pressure is applied to the tongue, bars, corners, and roof of the mouth. The bit rests on the bars of the mouth. (Bars are the spaces on the gums between front and rear teeth.) The longer the shank, the more leverage and the harsher the bit. Curb bits can also have curb chains on them, which exert more pressure in the horse's mouth. Curb bits can have straight or jointed mouthpieces. Some bits have an extra loop extending upward called a spade, which exerts pressure to the roof of the mouth.

The pelham bit is a curb bit with two sets of reins and is used in English style riding. This bit gives more control than snaffle or curb bits.

The hackamore has no mouthpiece--just a head stall and chin strap. It is used frequently by trainers on young horses. This prevents injuring the sensitive mouth of a young horse.

A bosal or bosal hackamore is very similar to the hackamore, except that the bosal has no chains or metal parts. Both exert pressure on the outside muzzle of the horse.

Types of Reins

There are two types of reins--single and split. A single rein is one piece with ends that attach to the bit. Split reins are two separate pieces, each attaching to one side of the bit.

Double and multiple reins are variations on single and split reins. Double reins are used with bits such as the pelham. Multiple reins are used with a team of horses pulling a wagon (one set of reins for each horse in the team).

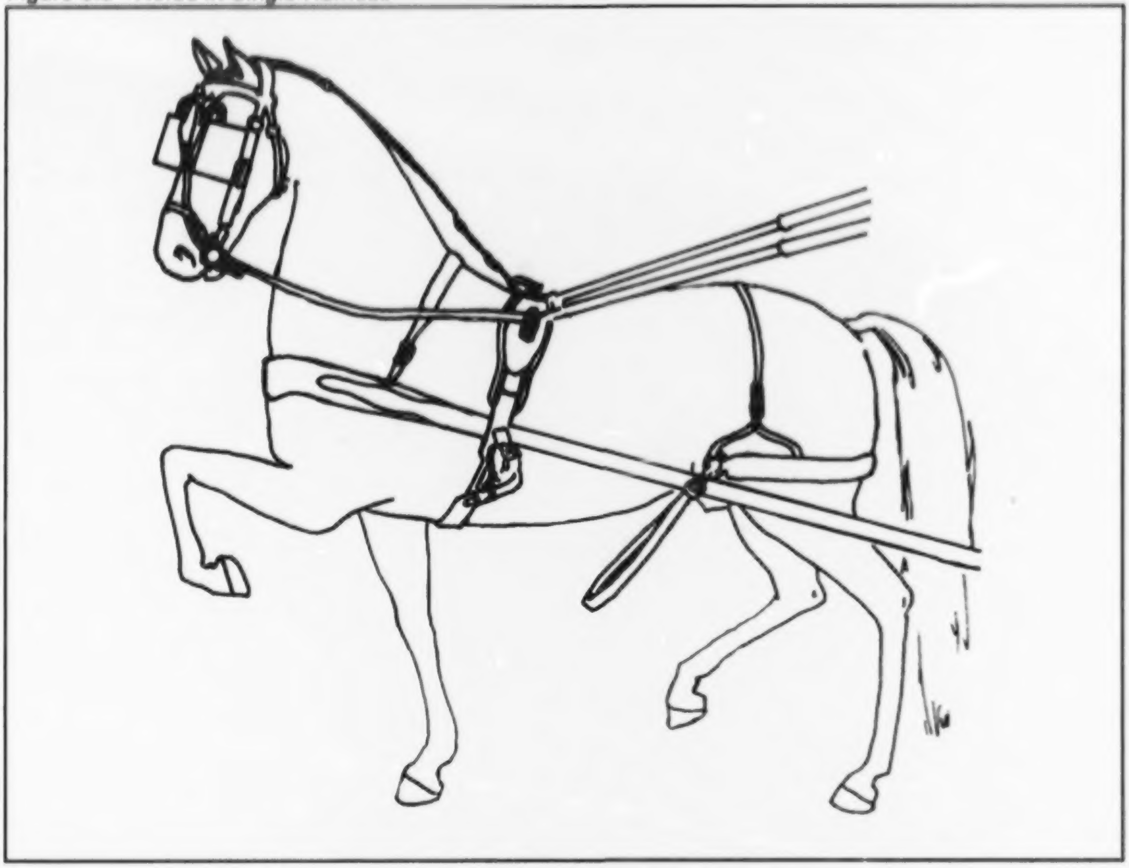
Equipment and Their Uses

Proper equipment for horses includes feeders, waterers, facilities, first aid kits, and grooming supplies. Feeding equipment can be as simple as five-gallon buckets for waterers and feed buckets, or it can be prefabricated especially for horses. There are advantages and disadvantages to each, with the main difference being cost. Feeding can also be done without any containers at all by pouring the feed on the ground. However, the biggest disadvantage is a greater chance of the horse picking up parasites from the ground. Using a watering fountain costs more but will help ensure available, fresh, clean water supply.

Every owner should have a grooming kit and a first aid kit on hand. These, too, can be simple (containing only the basics) or they can be very complete and contain everything available for use with horses. A basic first aid kit should contain scissors, gauze, rolled cotton, antiseptic, crepe bandage, vet thermometer, alcohol, iodine, a clean bucket, tape, antibiotic dressing, and a twitch. (See Restraints in Lesson 9 for more information on twitches.) First aid kits should also contain vet wrap, a clingy support wrap. Vet thermometers are specially designed for rectal use with livestock.

A grooming kit should contain at least a brush, hoof pick, sweat scraper, body brush, mane-and-tail comb, curry comb, clippers, shampoo, wash cloth, and a clean bucket. Each kit will be individualized, depending on owner preferences. Disinfect grooming tools and equipment routinely to prevent the spread of disease.

Figure 8.5 - Horse in Single Harness



The final part of equipment deals with transportation. Horse trailers are a big investment that must be justified. For an owner who does not go to rodeos or horse shows frequently, consider hiring someone to haul the horse(s) when needed. If a trailer is justified, consider several factors. It must be both road-safe (in good condition) and safe inside. If it is larger than a one-horse trailer, it should have a partition and adequate padding. If needed, a ramp should be long enough so that it is not too steep. Ramps should have traction so the horse will not slip while walking on it.

Costs of Equipment and Facilities

Depending on the owner's preferences and budget, equipment can be minimal or plentiful. When purchasing any equipment, put safety considerations first. Fencing is a major safety concern and should be as strong as possible. Fencing can be made from many different materials (post and rails, woven wire, pipe, boards, or wire) but should never be barbed wire.

Facilities range from simple and inexpensive to very costly. Regardless, facilities should always provide shelter to avoid such health problems as rain scald, a fungus that develops during continuous rain. Some kind of feeding and watering equipment is also needed. Horses kept in stalls need regular exercise.

There are numerous manufacturers of equine equipment, and prices will vary from dealer to dealer. Whether an item is portable or stationary also affects its cost. Get to know how something new works *before* purchasing it to make sure it will work for the desired operation.

Owning a horse is a big responsibility; even with the simplest of operations, it will not be inexpensive. Equipment needs to be maintained and occasionally replaced.

Summary

Understanding the different types of equipment used to handle horses helps make owning a horse safe and enjoyable. There is a wide assortment of products on the market that are designed just for horses. Horse enthusiasts should learn how a piece of equipment works before deciding to purchase it. Will it fit their needs? The style of equipment selected will depend on the type of riding or work that will be done, what the owner wishes to accomplish, and the size of the horse.

Credits

Curriculum Material for Agriscience 334: Equine Science (Topic #8899-B). College Station, TX: Instructional Materials Service, Texas A&M University, 1990.

Equine Management and Production. Stillwater, OK: Curriculum and Instructional Materials Center, Oklahoma Department of Vocational and Technical Education, 1994.

University of Missouri-Columbia Extension Division agricultural publications

a) G2844: Haltering and Tying Horses
b) G2845: Choosing, Assembling and Using Bridles
c) G2887: Selecting a Saddle

Ensminger, M. Eugene. *Horses and Horsemanship.* 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

Hawcroft, Tim. *The Complete Book of Horse Care.* New York: Howell Book House, Inc., 1994.

Lesson 9:
Handling Horses

Safety is the most important aspect of handling horses, for both the rider and the horse.

Leading a Horse

When leading a horse, a handler should always walk to the left of the horse with the right hand about 12-18 inches from the horse's head. The remaining length of rope should be held in the left hand, but *not* coiled around the hand. To prevent rope burn, never let a rope slip through the hand.

Walk evenly with the horse's head--not in front of it or too far behind it. Always make sure that gates are fully open. When releasing a horse into a stall or field, go all the way inside before unhooking the halter. Never leave a halter on a horse that is left out in the field. Horses wearing halters in the field can get caught on things, causing injury or even death. Halters need to be refitted periodically on young animals. If adjustments are not made, strangulation could result.

Lunging

Lunging is a method of exercising and training a horse. Lunging can be done anywhere, but is best done in a circular pen that is about 30 feet in diameter. It is an excellent method of training a young horse to walk, trot, canter, and stop on command. When lunging, always work the horse equally in both directions. Lunging can also be an excellent way to rehabilitate a horse that has been injured and cannot be ridden. It gives horses the exercise they need without stress.

Mounting and Dismounting

Before mounting, make sure the saddle is in the correct position and that the saddle blanket has not slipped or bunched up. Also, check that the girth is tight. Before mounting a horse, first move it forward a few steps to make sure it is standing squarely. Most people mount from the left side. Insert the left foot in the stirrup, straightening the left leg while swinging the right leg over the horse's back. Dismounting is simply reversing the mounting process.

Equitation

Equitation is the process of riding. There are several styles of riding; Western and English (hunter-jumper, hunt seat, racing, and dressage) are the most common. Most styles of riding are either Western or English. The English-type events contain more jumping and ballet-type movements than Western events.

Restraints

It is important that a handler be able to properly restrain a horse when needed. The method of restraint will depend on the horse and its temperament. The simplest form of restraint is the halter. For most occasions, this will be all that is needed.

Occasionally, it becomes necessary to use something stronger. In this instance, grip the neck or twist an ear to restrain the animal. If this does not work, a mechanical device known as a twitch can be used. (See Figure 9.1.) A twitch can be either a loop of rope that is attached to the end of a wooden rod or a scissor-type device. Either type works about the same because they are put on the upper lip and pressure is applied. This pressure causes the horse's brain to release endorphins that act to calm the horse. Rubbing the upper gums also calms the horse. Other methods of restraining a horse are sidelines and hobbles. Sidelines keep one of the horse's feet off the

Figure 9.1 - Twitch

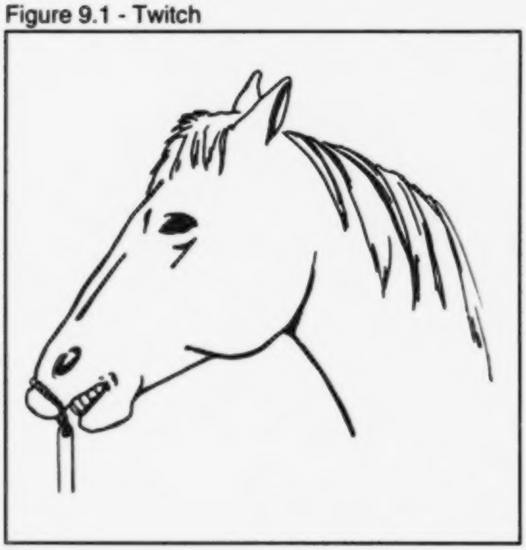
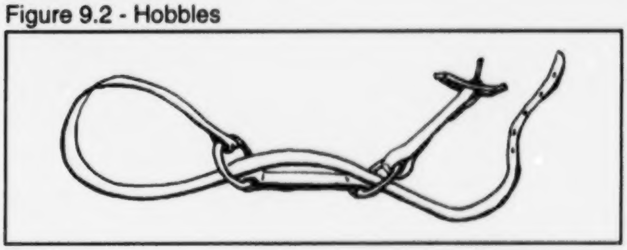


Figure 9.2 - Hobbles



ground, while hobbles fit around the ankles and limit the speed an animal can walk. (See Figure 9.2.)

Haltering

To catch and halter a horse, generally approach from its left side. Never approach directly from the front or from the rear because it cannot see well there. Always make the horse aware you are coming, never rush, and be confident. As you reach the horse, slip the lead rope around its neck to help restrain it, and then slip the halter around the neck and fasten it.

If the horse is hard to catch, keep the lead rope out of sight and keep the horse in a smaller area. Reward the horse after catching it, and remember that patience is a must.

Never tie the rope to yourself or allow yourself to become entangled. If the horse is startled, the handler could be dragged behind it. When tying a lead rope, it is important to tie to a secure object. The amount of freedom given to the horse's head is also critical. If too much freedom is given, the horse can get tangled in the rope. If too little slack is given, the horse could feel confined and react violently. (See Figure 9.3.)

Grooming

Grooming is an important part of the horse's health and training. Grooming keeps parasites down, helps maintain coat condition, teaches the horse to stand patiently, and gives the handler an opportunity to check for injuries. The amount of time and the frequency of grooming depends on the conditions in which the horse is kept. A horse that is kept in a stable and is ridden a great deal will need grooming more frequently than one that is kept out in a pasture and ridden infrequently.

When washing a horse, the excess water can be removed with a sweat scraper. Use cool (not ice cold) water in the summer and warm water during cool weather. Then, brush the horse with the grain (the direction the hair lies). If needed, any hair around the bridle path would be clipped. (The bridle path is the area behind the ears where the strap of the bridle goes.) The bridle path should be kept clipped so the hair won't get tangled in the buckle of the bridal strap. If the weather is cool or insects are numerous, it might be necessary to put a blanket on the horse, especially if the horse is kept in a stable.

The mane and tail on some horses are braided for show. This also keeps the mane all on one side and out of the rider's way. If the mane or tail grows too long, it will get matted and will take several hours to undo. Grooming for show is similar to daily grooming except that more attention is given to fine details. Different people have different ways of preparing their horses for show. Grooming will also vary from breed to breed.

One other important thing that should be done while grooming is to pick out the hoofs. This will help prevent stone bruises and thrush.

Safety Precautions for Trailering

The trailer should be in top condition with all running lights, latches, padding, and brakes in proper working order. The horse should have a strong, properly fitted halter, and lead rope. The horse should be well groomed with its legs wrapped for protection. Also, the tail should be wrapped to prevent it from being tangled by the wind. If the weather is cool, a blanket should be used to prevent the horse from getting too cold. The horse should be fed and watered two or three hours before loading. If going on a long trip, plans should be made to stop along the way to give the horse water and let it stretch its legs.

To load the horse, be careful when getting behind it. If it is resistant to loading, it might kick, which can injure a person severely. If needed, a rope can be tied around the hindquarters and pulled by the person leading the horse. If the trailer does not have a walk-through door at the front but only a side window, it is not advisable to lead the horse in. Instead, use a long rope and run it through the window to prevent getting crushed if the horse decides to go inside suddenly.

Before driving, double-check latches and prevent horses from putting their heads out of windows. A hay bag can be used to help keep the horse occupied while traveling and to give it some nourishment on a long trip. Tie the bag high enough to prevent leg tangling.

To unload a horse, use caution that the horse doesn't bolt out of the trailer. Always unload in a fenced-in area. Do not get between the horse and the trailer to avoid being pinned against the wall.

Regulations Dealing with Horses

Whether traveling in or out of state, it is a good idea to call the Department of Agriculture to determine what quarantine regulations exist in that state. Some local regulations might also apply. For example, one regulation might require a negative Coggins blood test before being allowed to participate in a local saddle club show. It is also a good idea to have liability insurance. This will protect the horse's owner in case of an accident. An owner can contact an insurance representative to check on appropriate coverage.

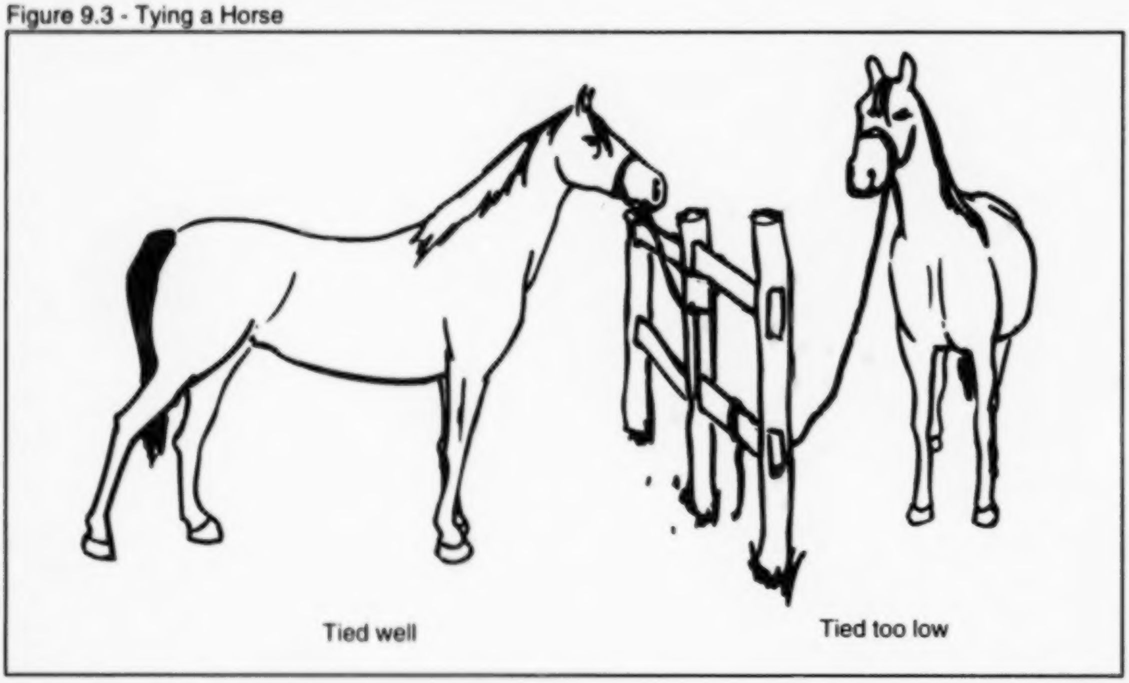
When buying a horse, it is a good idea to have a veterinarian give it a checkup. It is strongly advised to investigate regulations before going to a show or transporting the horse anywhere. Check with a local Extension agent, veterinarian, saddle club representative, and/or the Department of Agriculture for regulations. It can save a lot of time and money in the long run.

Summary

Owning and handling horses can provide a great deal of enjoyment, but it requires thought, planning, and care. Without enough preparation, there will be many problems.

The next important thing to remember in order to have an enjoyable experience with a horse is ***safety.*** Nothing can substitute for following safe practices when handling a horse. Remember that horses are a great deal larger than people and can injure someone without meaning to. It is also important to remember that horses depend on their owners to provide them with proper care and a safe environment.

Figure 9.3 - Tying a Horse



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Lesson 10:
Career Opportunities

There are many opportunities available in the horse industry for those who have the desire to work with horses. These opportunities are broken into two main types: primary and secondary. Either type offers many rewards and can become long-lasting careers.

Career Opportunities

A primary career is one that deals directly with horses, such as a trainer or handler. A secondary career is one that works with horses but has limited or no contact with them. Some examples include someone who sells equine pharmaceuticals or someone who makes horse trailers. Both careers contribute to the equine industry, although the workers may or may not have direct contact with horses.

Someone who wants to work with horses directly should gain as much experience in the industry as possible. A person does not need to be an owner to get into the horse industry. In fact, many trainers and race track jockeys do not own the horses they work with because these horses are very expensive to buy and own.

Examples of different careers in the horse industry are: owner, trainer, stable manager, veterinarian, jockey, farrier, auctioneer, rodeo announcer, concession stand worker, and grounds keeper.

Supporting Income

Most people who own horses do so as a hobby or raise them in a limited way. Usually, these individuals have another job that helps support the horse operation. Many breeders who raise horses incorporate another aspect of the horse industry to maintain the style of living they require. This includes boarding or training horses as a service to others.

Emerging Technologies

With technology changing very quickly, many new ways of breeding and training are being developed. In the past, a horse with a broken leg was destroyed. Frequently today, the animal can be treated successfully and live a normal life. Another development is the use of artificial insemination. Saving the semen or eggs from superior horses to use later is a step toward improving the future genetic pool of horses.

Training has also benefitted from technology. Blood samples can be taken to determine a horse's maximum amount of exercise. New equipment, such as a swimming pool especially designed for the horse, has advanced training a great deal.

Marketing Horses

There are several marketing options available to a horse breeder. The breeder can sell the best horses as breeding stock, either as mature breeders or as yearlings. The monetary amount that a horse will bring depends on its blood lines and the past performances of its ancestors. Another factor in the selling price of horses is the geographic area's needs and the breed of the horse. In European and Asian countries, horses are also sold for meat.

Summary

The horse industry has many careers available to an individual. A person does not have to work directly with horses to be involved in the horse industry. However, for those who do want to work with horses, there are many opportunities.

Credits

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